Comment Letters and Meeting Transcripts for the Draft Supplemental Environmental Impact Statement

The following pages contain the comments, identified by commenter designation and comment number, from letters and the transcripts from the public meeting on the draft supplemental EIS.

where you're going?

FACILITATOR BARKLEY: You'll be called. Typically, it's the normal protocol to call any elected or appointed public officials first. We actually have just one person that I know of, Mariea Geho of East Coventry Township, so I'll ask you to come up first. Is there any other elected or appointed officials that would like to speak?

Mariea, what I will do is have Dr. Cuthbert come up next, followed by Charlie Shank.

MS. GEHO: Thank you. Can everybody hear me? Do I have to hold this? I guess I have to hold it. Can everybody hear me? Okay. Hi, I'm Mariea Geho. I'm a supervisor for East Coventry Township living across the river from Montgomery County. And I just have a little blurb to say. The rehabilitation of Frick's Locks Village as a historical site and destination within the township is very exciting. The rehabilitation work performed by Exelon has given the village renewed life and has brought our history into focus. The community has benefitted as a result of Exelon's commitment to work with the township on preserving Frick's Locks Village. And they did a wonderful job. We had an opening there last week and it was really great. Thank you.

1-1-HA

FACILITATOR BARKLEY: Thank you, Mariea. Dr. Cuthbert.

DR. CUTHBERT: Thank you, Rich. Members of ACE have reviewed the 585-page NRC Environmental Impact Statement for the Limerick Nuclear Plant. You should be ashamed of this flawed and biased report. The document is incomplete, unreliable, and invalid. Your EIS is riddled with faulty assumptions, unsupported conclusions, glaring omissions, exemptions, delays and deferrals of vitally important and necessary actions and exclusions of numerous environmental factors that will have adverse implications for generations to come.

NRC's callous disregard for public health and safety is shocking. You are guilty of nothing less than regulatory malpractice. This public meeting/hearing has been sprung like a trap on our community. ACE objects to NRC proceeding on this EIS at this time with important questions and issues not yet addressed or answered. There is no need when Limerick's current licenses do not expire until 2024 and 2029. 2-1-LR

NRC has failed to acknowledge or respond in writing to substantial written testimony submitted by ACE in October 2011 on 14 major categories. 2-2-LR

Attached to this testimony today are a number of photographs representing display boards along the wall beside part of the audience this afternoon. They are part of our testimony in addition to the written and oral testimony that we're presenting today.

NRC has also failed to adequately respond to a number of additional questions submitted by ACE at your March 2013 annual Limerick performance review meeting for 2012 operations. A number of serious issues are going to be addressed in testimony presented by a number of members of the community this afternoon. Although we did receive a response with NRC, most of the responses were vague, nonspecific and insufficient.

The NRC, in our judgment, is recklessly placing the cart before the horse in this Environmental Impact Statement matter. NRC must stop and delay all activities and actions related to Limerick Nuclear Plant's relicensing including finalizing this EIS until after several issues are addressed or take place. Number one, Limerick's emergency evacuation plan has been revised to include three specific changes: immediate notification of radiation releases through independent monitoring and report; expanding the evacuation zone to 50 miles; and expanding the

2-3-OS

ingestion pathway zone to 100 miles. 2-3-OS Cont'd

Number two, the National Resource Defense Council legal action appeals on Limerick's severe accident mitigation analysis requirements have been resolved. That's an open, legal issue. 2-4-PA

Number three, Exelon has completed all necessary inspections, maintenance, and corrective actions at Limerick Nuclear Plant that have been deferred by NRC until some time between 2017 and within six months of the expiration of the current license in 2024. 2-5-OS

Number four, NRC's court-ordered high level radioactive waste study has been completed, 2014 or later, and all waste storage issues and rules are in effect, including for Limerick. 2-6-RW

Number five. Earthquake mitigation plans have been completed, 2017. And all necessary changes have been made at Limerick. 2-7-OS

Number six. NRC required vents have been install to prevent radioactive hydrogen gas buildup and explosions. 2017.

Number seven. Exelon installs filters for those vents to minimize radiation releases during meltdowns. NRC's own staff has concluded the consequences of not installing filters could be so bad

that filters should be required regardless of expense. 2-7-OS

Number eight. Exelon installs filtration for Limerick's water intake to reduce harmful air pollution from the cooling towers. 2-8-AM

Number nine. Exelon installs filtration for Limerick's radioactive and toxic waste water discharge to reduce contamination of the primary drinking water source for almost two million Pennsylvanians. 2-9-SW

And Number ten. Exelon installs filtration for toxic minewater pumped into a drinking water source in order to operate Limerick Nuclear Plant.

This premature and incomplete EIS is a pathetic example of a lack of courage and integrity at the NRC. You have abandoned and violated your own mission to protect public health and safety. You have betrayed this entire region once again. NRC's failure to protect our environment and residents is irrefutable evidence that you no longer have a moral compass. Your rush to rubber stamp Limerick's EIS and license renewals is a cowardly betrayal of every man, woman, and child in this community, as well as future generations that will unquestionably be harmed by 20 additional years of operation at Limerick. 2-10-LR

It is our conclusion and recommendation that the United States Senate should investigate the NRC for willful blindness and regulatory malpractice and disallow or forbid all permitting decisions for Limerick Nuclear Plant until all unresolved findings, legal issues, and recommendations including those from your own staff are finalized and implemented.

And finally, ACE today is formally requesting on the record that NRC hold a public hearing in Pottstown at some date in the future to address all of the relicensing issues for Limerick Nuclear Plant not specifically or adequately addressed in the Environmental Impact Statement. 2-11-LR

Our community deserves nothing less.

(Applause.)

FACILITATOR BARKLEY: Thanks, Mr. Cuthbert. Charlie Shank. And Donna, you'll be after him.

MR. SHANK: Thank you very much. I was hoping the lady who was the supervisor from East Coventry would still be here but I see she has left.

My comments concern the groundwater, an issue that is finally getting some attention at U.S. nuclear plants is the leakage of radioactive water into the ground, beneath and around these plants. All 3-1-GW

plants leak. These leaks come from pipes, tanks, and many of the plant's systems. The NRC states that events happen at all plants that are often unknown of, unseen, uncontrolled, and unmonitored releases of radioactive liquids into the ground. Exelon spokesmen will tell you that they monitor everything and that they have everything under control. Don't believe it.

The NRC's statement contradicts that propaganda. These radioactive releases are in addition to the known surface spills that frequently occur. In 2006, nuclear plants started a program to check into this mounting leakage problem. Fifteen wells were drilled on Limerick property outside of the power block areas where the reactors and other equipment sit. One well, P12, south and downgrade of the power block area, showed 4400 picocuries per liter of tritium, well over the reasonable European safe drinking water level for tritium which is 2700 picocuries per liter.

3-1-GW Cont'd

Not liking the result, that well was closed and almost immediately a new well was drilled. Well NWRL-9. This well west and downgrade of the power block showed 1700 picocuries per liter. Over the next few years as all 15 wells were tested, they all showed tritium and all showed gross beta emitters. Three

wells contained gamma emitters, nine had alpha emitters, four out of five wells tested positive for uranium. All the ground around Limerick's plant is radioactively contaminated. Most water flow at Limerick, both surface and subsurface, is to the south and west towards Possum Hollow Creek, the Schuylkill River and yes, East Coventry Township.

3-1-GW Cont'd

Many wells on the East Coventry side of the river are in the same Brunswick fractured bedrock formation.

Recently Exelon re-gifted East Coventry with 154 acres it had taken by eminent domain from private citizens and the townships 30 years ago. This land could have been subjected to possible radiation contamination above and below the surface for many years before it was returned. This story reminds me of the Trojan horse story. With Limerick's renewed license and at least 30 more years of contamination to come, imagine what this land could turn into. No independent radiological study was ever done before this land was transferred. The people of East Coventry should insist on radiological studies now and in the future.

I am very grateful for Mr. Michael Moyer, East Coventry supervisor, for his ability to see the possible serious problems with this situation and

question this decision. I say beware of utilities bearing gifts.

I support Dr. Cuthbert's call for a congressional investigation of the NRC. And I call for the public meeting on the relicensing to also be held right here in Pottstown so we can all attend. I thank you very much.

(Applause.)

MS. CUTHBERT: NRC's Environmental Impact Statement makes illogical, inaccurate, absurd, and indefensible claims, claiming Limerick's environmental impact small is an offensive lie. NRC fails to honestly assess Limerick's past, current, and additive harm since 1985. NRC did not do testing.

ACE repeatedly requested comprehensive, independent monitoring and testing for this EIS. Instead, we got a despicable whitewash. ACE documented how and why Limerick Nuclear Plant presents unprecedented environmental threats and health harms to our region in written testimony to NRC in October 2011. Based on that, we reject NRC's invalid, unsubstantiated prediction of small future harms from Limerick.

4-1-LR

NRC failed to respond to our massive documentation. Would acknowledging facts require NRC

to close Limerick? NRC wouldn't give ACE one hour for a meeting with NRC's Environmental Review Team. NRC clearly doesn't want to face the facts. 4-1-LR Cont'd

ACE's display boards at this meeting are intended to identify significant harms NRC chose to ignore for Limerick's EIS. ACE analyzed Limerick's air and water pollution permits and Exelon's radiological monitoring reports which document enormous harms. NRC's PR people are embarrassingly uninformed about Limerick's air and water pollution. Instead of giving ACE an hour, NRC met with agencies that just issued five-year pollution permits with exemptions for high levels of dangerous pollution in violation of protective laws. 4-2-LR

Radiation reports for Limerick confirm many radionuclides are in our air, water, soil, sediment, and fish. Yet, NRC keeps claiming Limerick's radioactive releases are just tritium. Over 100 radionuclides are associated with Limerick operations. NRC looks foolish. 4-3-RW

One Limerick radionuclide is confirmed in the babies' teeth of our children at some of the highest levels in our nation. Additive, cumulative, and synergistic harmful since 1985 are unknown, but clearly enormous. 4-4-HH

NRC never did independent testing for each radionuclide or toxic chemical in each round of exposure. NRC's EIS conclusions rely on self-serving biased calculations, estimates, monitoring, and reports totally controlled by Exelon, the company with a vested interest in the outcome that has shown it can't be trusted.

4-4-HH Cont'd

4-5-LR

Exelon's deceptive radiation monitoring tactics were identified by ACE. Included radwaste monitoring declared inoperable for over a year. Exemptions from reporting using lame excuses like misplaced monitors.

4-6-OS

To base EIS conclusions on visual site inspections is ridiculous. You can't see, smell, taste, feel or measure radiation or other toxics that are released offsite from Limerick. Thus, confirmed Limerick's environmental harms are enormous, not small.

Limerick is a major air polluter under health-based standards of the Clean Air Act releasing so much air pollution from the cooling towers that a six-fold increase was granted in 2009 for the kind of air pollution that's more deadly than ozone.

4-7-AM

Limerick's PM-10 air pollution transports cooling tower toxics, pathogens and radionuclides into our air every day with 44 million gallons of steam.

Exelon refused to install cooling towers at Oyster Creek citing too much air pollution as the excuse. Need we say more?

4-7-AM Cont"d

Limerick is slowly, but surely destroying the drinking water source for almost two million people from Pottstown to Philadelphia. Limerick discharges a 14.2 million gallons of radioactive heated waste water every day. Limerick drastically exceeds safe drinking water standards. Without filtration Limerick can't meet safe standards and Exelon won't pay to filter.

4-8-SW

The river water, sediment, and fish are contaminated with many radionuclides. That includes radioactive iodine like that in Philadelphia's drinking water, plus many others. Limerick's discharges are over heating the Schuylkill River threatening the ecosystem. Limerick discharges up to 110 degrees into a river with an 87 degree limit every day.

4-9-RB

Cooling tower water used threatens drinking water supplies across six counties. Limerick withdraws more water than three towns -- doubles what three towns take in, Pottstown, Norristown, and Phoenixville. Cooling towers depleted the Skuylkill River since 1985. By 1999,

4-10-SW

there were record low flows in the Schuylkill River. Since 2003, Exelon pumped billions of gallons of toxic unfiltered minewater into the river for Limerick operations. Decades of radioactive leaks and spills contaminated groundwater. Fifteen of 15 wells detect beta radiation. Nine detect alphas. Three gamma. Four uranium. These radioactive leaks were never cleaned up and really this offensive EIS whitewash must be rejected by elected officials and the public. 4-10-SW Cont'd

(Applause.)

FACILITATOR BARKLEY: Thank you, Donna. Betty Shank. And then Steve Aaron is up next.

MS. SHANK: NRC regulations have become as deteriorated and unprotective as Limerick's aging equipment. That equipment is plagued by thinning, pitting, fatigue, erosion, leaching, embrittlement, and GE Mark II boiling water reactor stress corrosion cracking. The list of opportunities for disaster is endless. 5-1-OS

Limerick monitoring equipment has been out of service, unnoticed sometimes for more than a year, and automated systems have failed, discovered only after accidents occur.

Public statements by NRC and Exelon following such events are generic and deceptive. The

public receives no more respect than the river that Limerick is destroying and the air that it is polluting, all for Exelon's profits. NRC and Exelon have gone through all the motions required for relicensing, but it seems to be all for show. Hollow evacuation plans, lack of meaningful regulation, perfunctory public inclusion, and NRC's willful blindness to the consequences of our routine radiation exposure, increased public risk. It's a nightmare, affecting the health of our families and the environmental legacy we leave our children and grandchild. 5-2-HH

Back in the '80s before Limerick construction was complete, a suit was filed when the public understood that Limerick operations would violate clean air standards and that design alternatives should have been considered. The suit was won in court, but successfully stalled until Limerick construction was complete. Back then, too many officials fell into the trap of weighing economic factors more heavily than public protection.

Elsewhere, more enlightened thinking led to cancelled construction plans and closed plants.

Exelon makes no secret of the fact that its first concerns are profits and investors. Exelon

executives believe nuclear plants create the profits, but that's because the public has been forced to support nuclear energy and an egregious example of corporate welfare. We get sick. Our drinking water supply is reduced and contaminated. Our air is polluted and still we not only pay for many of Exelon's nuclear business costs, but for its mistakes as well. It is the height of injustice for NRC to allow this corporate abuse to continue when safer electric power is available.

5-3-SW

When NRC and Exelon claim that Limerick operations comply with NRC regulations, don't be fooled. There's hardly anything left of them for Exelon to comply with. It's hard to imagine the risks that lie ahead in the decade that's left of Limerick's current license, yet alone 20 years beyond that.

5-4-OS

NRC may be approving Limerick license renewal simply because it can, not because it is the only option or the right thing to do. So this extraordinary breach of public trust will allow Exelon to continue its premeditated assault of humanity and the environment purely for profit. What a travesty. I fully support ACE's recommendations.

(Applause.)

FACILITATOR BARKLEY: Thank you, Betty.

Steve. Following Steve will be Lorraine Ruppe.

MR. AARON: Good afternoon. My name is Steve Aaron. I was born and raised in Montgomery County and now live in Dauphin County, Pennsylvania. Thank you for the opportunity to speak here today in strong support of the proposed relicensing of Limerick Generating Station.

As one of the founders of the Pennsylvania Energy Alliance, I speak on behalf of a state-wide group of independent community, business, and environmental leaders and organizations representing a variety of professional backgrounds. We formed the coalition more than four years ago as a forum for like-minded Pennsylvanians who believe nuclear energy is a critical component of meeting our energy needs and to advocate for the continued operation of clean, safe, and reliable sources of electricity generation all throughout Pennsylvania. 6-1-SR

Our members consists of a former Secretary of the PA Department of Environmental Protection, a former Pennsylvania Game Commission executive, a former Secretary of the PA Department of Environmental Resources, and a former Secretary of the Pennsylvania department of Conservation and Natural Resources. Like me, these environmental stewards all believe

nuclear energy has an important role to play in our Commonwealth, and a green nuclear facility such as Limerick operates safely and well within environmental standards.

Nuclear energy provides clean energy that helps to power our homes and businesses reliably and safely. I personally have met many of the men and women who work in this industry and I know them to be smart, conscientious, earnest and passionate about the work that they do.

6-1-SR Con'td

As you know, Pennsylvania is among the nation's largest producers of nuclear energy. To meet our ever-increasingly demand for electricity in a way that does not destroy our environment, we need a diverse energy mix that includes nuclear power, cleaner fossil fuels, renewable sources and energy efficiency. Conservation alone will not offset the expected growth in our electricity use and renewal sources like wind and solar, while certainly important, are often unreliable.

Support for nuclear power throughout the Commonwealth remains strong. In 2012, the PA Energy Alliance conducted a public opinion poll of nearly a thousand Pennsylvanians from all across the state that showed 90 percent of those surveyed believed nuclear

power is an important part of meeting the country's electricity needs. More than three quarters believe that nuclear is a reliable source of energy and perhaps most importantly for today's proceedings, more than seven in ten support allowing existing nuclear power plants to extend their operating licenses.

6-1-SR Cont'd

We are pleased to see strong support comes from residents who live closest to our nuclear facilities. So on behalf of the membership of the Pennsylvania Energy Alliance, thank you for the opportunity to share these thoughts with you today.

(Applause.)

FACILITATOR BARKLEY: Thank you, Steve. Lorraine. And then Marci Dietrich will follow.

MS. RUPPE: Hi, my name is Lorraine Ruppe. I want to add, too, that today is a really bad to hold the meeting, because most people are either away, on vacation, or getting ready to go away on vacation. I'm concerned about an earthquake triggering one or more meltdowns at Limerick Nuclear Plant. What worries me are the miles of hard to inspect pipes and cables buried under Limerick that can be disrupted and then incapable of delivering vital electricity and cooling water to prevent meltdown. NRC should be worried, too, but instead gave Limerick until 2017 to come up with a new

7-1-PA

7-2-OS

seismic risk study or plan. It's beyond negligence for NRC to allow Exelon to wait years to take action.

Limerick is considered a high-risk nuclear plant and earthquake risks are increasing. My search for earthquake fault lines closest to Limerick Nuclear Plant is one big reason I have no confidence in any of NRC's conclusions in Limerick's Environmental Impact Statement. May 2011, I asked NRC how close the nearest fault lines were to Limerick Nuclear Plant. Six months later in September 2011 at the first EIS hearing, I repeated my request. When NRC finally responded, I received a letter and a map showing earthquake fault line 9 and 17 miles from Limerick. 7-3-GE

Later, I learned NRC failed to disclose an earthquake fault right under the Limerick site and two others within two miles. Local residents discovered a 1974 seismic study for Limerick in the Pottstown Library, clearly identifying these faults. So why did NRC fail to disclose these faults when I asked about the closest earthquake faults to Limerick? Was this a cover up or incompetence? Neither is good.

April 18, 2012, NRC's Andrew Rosebrook, who sent me the map and letter, claimed to be unaware of the fault under Limerick when shown the seismic maps at the library.

The August 2011 earthquake in Virginia shook Limerick Nuclear Plant and caused a Limerick notice of violation. This should have caused NRC to require Exelon to reduce seismic risk immediately. 7-4-GE Rosebrook did admit that the Ramapo Fault just 17 miles from Limerick is active. He also validated my concern about the blasting at the quarry bordering Limerick.

Fracking could trigger an earthquake, disrupting underground pipes and cables. Over 3,000 gas wells were approved in Pennsylvania. Two thousand more are to be approved this year. Structural problems and flaws associated with Limerick construction are of concern. For example, Limerick's PAC 70 fuel pools 7-5-OS were constructed with substandard cement. After all of this, NRC isn't requiring Limerick to do important seismic upgrades until after 2017, even though Limerick is considered by some to be third on the nation's earthquake risk list.

By then we can have an earthquake and a meltdown. Limerick should never have been built in the first place. NRC falsely claims earthquake risk were considered prior to Limerick approval. That's not true. The first reactor was delivered to Limerick's construction site in 1972, two years before this 1974 when the seismic study was completed. With

earthquakes becoming stronger and more frequent NRC owes it to us to shut Limerick down before it melts down. Thank you. 7-5-OS Cont'd

(Applause.)

FACILITATOR BARKLEY: Thank you, Lorraine. Marci. After Marci will be Kim Murphy and then Scott Portzline.

DR. DIETRICH: My name is Dr. Marci Dietrich. I'm a physician that's lived always in this area, well, you know -- I wish I was a speechwriter like you. You know? He's written all these speeches and you do a great job for government people, and that's your job.

This isn't my job. I'm a doctor. And I'm not a professional speaker and I'm not a nuclear engineer, but I am a physician. And I'm a physician who has seen lots of patients with cancer and other problems that have increased over the years, even thyroid cancer.

What I'm hoping to do here and I'm winging it because I really wasn't ready to do this, but you had your meeting and I had to be here if I wanted to put my two cents in. I think that we could really simplify, clarify the players in all this because right now this is very confusing. We hear numbers and they

go right over your head, oh, it's bad. That sounds bad. But then, hey, it's positive and there's tons, 500 pages of this and 500 pages of that. Really, let's figure out what's going on and first we need to know who the players are, okay?

The players are the stakeholders. I'm not a stakeholder, but a stakeholder would be, for example, Mr. Barkley, you're a stakeholder. And Ms. Perkins, you're a stakeholder. Exelon is a stakeholder. The Delaware River Basin Authority is a stakeholder. The previous person from the Commission, a stakeholder.

So now what does that make me? Well, I am a citizen and I am a landholder. And I can be an upholder. And what an upholder is someone who has a purpose who wants to elevate something to believe in, something that is extremely important. And so landholder, so I have land. I have property. And my property could get really messed up by radiation and be contaminated and that wouldn't be good. I own my body, too, and with owning my body and its relationship to being radiated and having other problems, I have concerns for that. So an upholder -- I'm a landholder and an upholder and you guys are stakeholders.

I was going to bring you a stake, as just a visual, but I didn't. I thought, you know. I

thought about cheese and a mousetrap, you know, and how energy is cheese and then the little mouse wants to get the cheese and he has to take risks to get the cheese and then sometimes the trap is going to close on him and he's going to lose his head. So I didn't do that because I thought we'd get injured with the mousetrap. Think about that, injured with a mousetrap versus getting injured by radiation. You know?

So anyway, there are more stakeholders here, too. Right.

So there's stakeholders and there's upholders and there's landholders. So we're simplifying it a little bit. Now let me see, I'm wondering why do we have to have a relicensing, right now, for 20 more years for Exelon? I don't get it. If it's already licensed now to like 2017 or 2024, 2029, why are we in the world have to do this now unless we're waiting for something bad to happen? We better get the license on board first because if something really bad happens, well, maybe we'll stop to fix it. We can't get shut down if we already have the license. I don't know. I was a naval officer one time, but I'm not someone who knows a lot about systems.

So what's the rush of getting the license right now? Well, I don't know.

8-1-LR

there's easily going to be a congressional investigation about the NRC.

So I have so much that I could talk about and what I really want to put at the last part of this, that I didn't get into is basically we have a way of quantifying and qualifying the risk now to humans and that is genetic testing. We can actually test the genes and do studies now of the people that live in the region of a nuclear power plant. We know that nuclear energy or nuclear problems occur in damaged chromosomes. We now have the technology and medicine and research to actually look and take blood from people that live in a region of nuclear power and actually demonstrate what is going on inside that person's body, things that just because we don't see it on the outside of a person, does not mean that there is not chromosomal damage already that we can quantify, qualify in their blood. 8-2-HH

Why there has not been any research ongoing about that, I don't know. The good old Tooth Fairy test of strontium-90, that sort of has been pushed to aside, but we have had the technology to actually do research on genetic changes in people's blood from radiation and let's look at the results of that. Let's have tests done about and let's see what's going on and we can

actually really take note of this and go from there about what damage is really occurring and that's not from a meltdown. We know that happens. We know there's breakage of chromosomes and such. But what really -- we can look at the silent damage that's occurring from just the normal use of a power plant.

8-2-HH Con'td

So just some ideas. Sorry I was a little bit blunt. I have more I can say, but I'll leave that to another time. So I hope you got something out of that.

(Applause.)

FACILITATOR BARKLEY: Thank you, Marci. Kim.

MS. MURPHY: Good afternoon. And thank you for the opportunity to speak to you today. My name is Kim Murphy and I am president of the Berks Conservancy. The Berks Conservancy is a 501(c)(3) nonprofit land trust and conservation organization based in Berks County, Pennsylvania.

I am here to testify on behalf of the Schuylkill River Restoration Fund that Exelon supports. The Berks Conservancy has been a successful annual award recipient and implementer of the Schuylkill River Restoration Fund grants for agricultural best management practices since the

9-1-CI

inception of the fund.

The implementation of agricultural best management practices directly affect the quality of water in the Schuylkill River watershed and are done to positively impact the drinking water for hundreds of thousands of people who live in our region. The Schuylkill River Restoration Fund grant awards have been critical to the completion of dozens of agricultural best management practice projects on 11 different farms in Berks County. These projects are done in prioritized subwatersheds of the Schuylkill River watershed, generally those where they are ranked as the most impaired.

9-1-CI Cont'd

The Schuylkill River Restoration Fund as a private grant fund has granted us over $1.3 million since 2008 and has enabled us to leverage larger, significant public funds including USDA Natural Resource Conservation Grants.

Our Schuylkill River Restoration Fund Agriculture Best Management Practice Project has taken a holistic approach to water protection utilizing conservation and nutrient management planning. The north storage barnyard patrols, stormwater controls, segregating clean rainwater from surface manures, stream bank venting, prescribed grazing, and riparian

buffer restoration.

Investment in conservation measures on Schuylkill River watershed farms is critical on numerous fronts: upgrading farm facilities, especially in regard to the manure management and fertilizer dollars helps to keep farmers competitive and successful. When farms are competitive and successful, conversation of farms to development is less likely to occur, thereby retaining fields capable of groundwater recharge as opposed to the impervious surfaces of housing and commercial ventures which generate serious stormwater and water quantity impact.

9-1-CI Cont'd

Proper management and timing of application of manure by segregation from surface waters on farms and stormwater generated on farms is not only beneficial to farmers' time management and bottom line, but it's also beneficial to plant growth and production and to water quality as nutrients are utilized by crops and not lost in streams, thereby protecting water quality.

The implementation of this agricultural best management practice, Schuylkill River Restoration Fund Project has also served as the impetus for public drinking water suppliers to participate and invest in these projects as additional funders and has been an

exemplary model for public/private cooperation and a successful mode for accomplishing the work on the ground for water quality.

The Schuylkill River Restoration Fund has positively influenced the water quality and quantity of the surface water of the Schuylkill River watershed utilized by local and regional drinking water suppliers like Philadelphia Water Department, Aqua PA, Reading Area Water Authority, Western Berks Water Authority, Birdsboro Water Authority, and Kutztown Borough. 9-1-CI Cont'd

The Berks Conservancy strongly supports the continuation of the Restoration Fund for its benefit to the food and water supplies security of the Schuylkill River watershed and welcomes Exelon's continued support. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Kim.

MR. PORTZINE: Hello, everyone. My name is Scott Portzline and I'm from Harrisburg, Pennsylvania in Norfolk County. I see everyone is from Norfolk County.

Steve, you're working with some outdated data on the expected growth of energy use. It's been declining. The growth is only occurring about one third of what it used to be. And wind power is actually

conclusions that are all throughout that document. And I could focus on a whole bunch of them also as the two previous speakers said. But I'm just going to talk a little bit about the vents.

The plants are no longer required to have hydrogen recombiners. So during an accident event, much hydrogen is created. But they no longer are required to try to eliminate that problem that leads to an explosion. The vents that were used in Fukushima did employ the fix that was recommended here in the United States by the Nuclear Regulatory Commission. One hundred percent of those vents failed. It's a very similar vent that's here at Limerick. 10-1-OS

In an accident scenario, the releases could be much more dangerous than what these reports assume. This is one of the faulty data sets that I'm going out. This conclusion should not be accepted by anyone because the assumptions that are made are not conservative meaning on the side of safety. They are sometimes at best protective of their interest rather than the health and safety of the people.

Paul Gunter and I knew during the Fukushima accident that they were going to have an explosion. And we talked about it the day before it happened. Paul Gunter is here in the audience. He'll be speaking in

a little bit, probably. And Paul Gunter got to say that on CNN the day before the explosion that there was going to be a hydrogen explosion because of the melting fuel in the fuel rods.

Well, I'll tell you the rest of the story another day, but you can see the transcripts on CNN. Paul got blasted for that. So sometimes people dismiss what anti-nuclear people or safety critics have to say. I'm telling you, coming from Three Mile Island, heed warning the people from ACE are saying. I really agree that this whole licensing process shouldn't even be happening right now.

Concerning evacuations, well, let me go back to radiation. You had radiation detectors in the building. You have hydrogen that's not being accounted for properly. The Nuclear Regulatory Commission no longer has their own monitors that they maintain for radiation at nuclear plants. They're relying on the states to do that and the licensee to do that. Fortunately, at Three Mile Island, we have our own radiation monitoring network from the citizens. 10-2-OS

Evacuations. A year ago, I provided documentation that the severe accident -- well, it's called a state-of-the-art accident consequences analysis, showed that it was rigged. There's probably

going to be an investigation into that. May end up being in Congress, possibly bordering on the criminal investigations, whatever regulatory agencies, whatever that would be called.

The premise that there's no undue risk, that's what this is all about. Is there undue risk associated with this relicensing? The answer is yes. The premise that no undue risk will occur is always about a timely evacuation. The NRC is not charged with protecting your property. They're charged with making sure you get out of town if something terrible starts to happen.

Could somebody show me one accident that happened in the world where a timely evacuation occurred? Or even where one was ordered in a timely way? It's not going to happen. Because what will happen is that people at the plant will finally realize, wow, the conditions are such that we've got to order an evacuation which did not happen at Three Mile Island. The reactor was already in the condition that the evacuation should have been ordered. It was pre-agreed. Yet, they didn't follow that guideline.

10-2-OS Cont'd

So the plant will call the governor's office and the governor will say okay, thank you. He'll take ten minutes to think about it. He'll start

getting some phone calls saying now wait a minute, we think we got this going for us. And it gets delayed and it gets delayed. Next thing you know evacuation gets ordered and people are going around with higher degrees of radiation because they waited too long. That happened at Three Mile Island. Fukushima, plenty of disagreements of when evacuation should have taken place, let alone the cleanup.

10-2-OS Cont'd

So I guess lastly I want to talk about sabotage because that's what I mostly do at every nuclear power plants and counterterrorism issues since 1984. Never went public until 1993 as a result of an intrusion where a man drove a station wagon into the nuclear plant at Three Mile Island into the turbine building itself. It took four hours to find him and of course everything was fine according to the NRC report until the federal hearings came up and made them reconsider security.

10-3-OS

Well, things are a lot better in the security state, but there's still some problems. But I want to point out one specific issue using their report and it's in Section 5.2. This will be the last thing I have to say. In Section 5.2 regarding severe accidents, they did an analysis of sabotage and said that core damage and radiological release from such

10-4-PA

acts would be no worse than the damage and release expected from internally-initiated events. Well, first of all, that wording should be changed. Internally initiated could indicate sabotage even from an insider. So that should be accidental events rather than internally. We're talking about sabotage versus accident. 10-4-PA

The second and most important of what I'm saying is they say they could identify no issues that were greater than internally-initiated events. What if the containment building is no longer intact? What if the saboteurs found a way of nuclear transport -- there's that nuclear term, engineering term -- of radioactive material outside the containment building during a sabotage event. Well, that happened at Three Mile Island, not from sabotage, but the valves in the drain were already lined up, where radioactivity was escaping the building early.

What if you had a hole in the containment building like at Fukushima or from a saboteur? The SOARCA study that was rigged continued the analysis to scenarios where the containment building remained intact. I have the email from the Nuclear Energy Institute stating this would solve some of our problems if we just leave the containment building intact.

That's why this study is wrong. Thank you.

(Applause.)

FACILITATOR BARKLEY: Our next speaker will be Shirley Whyte, followed by Tana Rinehart. Shirley.

MS. WHYTE: It is my feeling, and a lot of other people I know, that the NRC should not even be considering relicense of Limerick nuclear power plant considering the density of our population and the increasing risk that exists for a meltdown. 11-1-OR

Limerick is the second most densely populated nuclear plant in the nation. Relicensing would be a major adjustment to millions of people in the greater Philadelphia area. Evacuating from a meltdown would be far worse than any evacuation portrayed by Hollywood. There would be traffic gridlock, accidents, panic. It will keep people directly exposed to massive radiation for far too long, increasing the risk of immediate radiation sickness and eventually cancer and other disease and disability. People could become so radioactive they might be turned from a hospital. The hospitals here are not equipped or prepared to have such a disaster. They train for natural disasters, but not massive radiation exposure. 11-2-OS

Reality suggests that the population could

evacuate safely. I mean it can evacuate safely. Montgomery County officials basically confirm that in the 2011 testimony to you to the NRC that they already knew in 1980 a public hearing on evacuation, the NRC said Limerick could take double the population that could be safely evacuated within 30 miles. And now they know 30 miles is not nearly enough, even close to the safe distance to avoid radiation plume.

The NRC allows Limerick to move forward, despite risk to so many. And now the NRC plans to relicense Limerick knowing the population density is four times than the original number that they thought they could evacuate safely.

11-2-OS Cont'd

I have devastating caused by evacuation decisions by the Japanese government at Fukushima. NRC was supposed to approve Limerick's evacuation plan by looking at the population growth and the distance needed to escape the radioactive plume. Instead, NRC is dismissing lessons learned from Fukushima, trying to deceive us about radiation impact, weakening evacuation plans and failing to expand evacuation zones.

In 2001, the ACE reported "Exelon seeks to cut costs in planning for emergencies." The NRC allowed PECO and Exelon to cut corners at the expense

of public interest. NRC's new rules make no sense. NRC now allows emergency drills to be run without practicing for radiation releases. NRC requires fewer exercises for radiation accidents. NRC's recommendation is fewer people evacuate after an incident to avoid a gridlock. So they'll do it in stages. 11-2-OS Cont'd

Is the NRC abandoning the public safety for NRC's profits? Changes need to be made to minimize the risk of innocent people becoming nuclear refugees, losing their homes and all their possessions. This kind of risk cannot be dismissed for any corporation's profits. In 1980, at the evacuation during PECO's VP plant an evacuation could never be needed. That was the same thinking about TMI in 1979. The same thinking at Fukushima until it happened. It is ironic that we only have to say TMI, Chernobyl, Fukushima and everyone knows what happened at these places. No other explanation is needed.

So I'm asking the NRC to close Limerick before this area is known only as the next nuclear disaster, before this area is known only as Limerick. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Shirley.

Tana. Paul Gunter is up next.

MS. RINEHART-ULLMAN: First I want to apologize for my little noisy guy. I just want to say I'm a local resident. I've been born and raised in Pottstown. My name is Tana Rinehart-Ullman. I'm raising -- I obviously have a little guy here. I run a local daycare as well. We have toured Limerick, have taken the children on field trips there and they've always had such excellent field trips. The kids always enjoyed going there to learn about Limerick and learn about nuclear power and how it benefits our community.

Also, they support local children's organizations such as soccer clubs and other -- 12-1-SR
baseball teams and things. They have been great supporters of the community. I would have no problem. I like the safeguards. We have a very comprehensive plan in place in case something would happen with Limerick, what to do with the children and how to get them safely out of the area. But I have no doubt that we will ever, ever have to use that plan and I've been working in this industry for 21 years now. Thank you, Limerick.

(Applause.)

FACILITATOR BARKLEY: Thank you. Paul.

MR. GUNTER: Thank you. My name is Paul

Gunter. And I am director of the Reactor Oversight Project at Beyond Nuclear and that's in Takoma Park, Maryland. And I come three hours north here because the Limerick license extension process is, in fact, not a local issue. It is a regional -- it is a national concern and risk and threat.

I'm here to speak in opposition to the Limerick relicensing primarily because the NRC, following the Fukushima accident, should suspend all relicensing license extension reviews, particularly this is important because the Limerick unit is similar to the General Electric boiling water reactors that exploded at the Fukushima Daiichi nuclear power plant site. So it's a concern that the Agency and the industry are proceeding with a conveyor belt-like process that is ignoring the environmental impacts. It's failing to consider the environmental impacts that are still coming out, that are still being revealed by the accident at Fukushima. 13-1-OS

I can tell you that the concern goes far beyond just the fact that the NRC is ignoring these concerns. The problem is that the NRC doesn't have the ability or the will to actually challenge a license extension for any nuclear power plant, let alone the Limerick plant as it is a sister plant to Fukushima

Daiichi.

The problem is also that we've got -- the NRC has already relicensed 75 nuclear power plants in the United States and they are proceeding. They have yet to significantly challenge or stop a license extension for any of these plants despite all the questions. But for the Limerick plant, it's particularly egregious because the NRC knows that this power plant is in violation of its license agreement. So they're talking about extending a license agreement violation. And I'm specifically referring to the general design criteria.

Let me read you what the general design criteria says according to the NRC's own requirement. "The principal design criteria establish the necessary design, fabrication, construction, testing, and performance requirements for structures, systems, and components important to safety. That is structures, systems, and components that provide reasonable assurance that the facility can be operated without undue risk to the public health and safety." How can this Agency proceed with licensing, relicensing in view of the dramatic failures that we all witnessed world-wide on television at the moment at Fukushima Daiichi and those series of explosions which now

13-2-OS

demonstrate that the General Electric Mark I boiling water reactor containment system is a 100 percent guaranteed failure. Three operational units at the time, Units 1, 2, and 3, 100 percent failure under severe accident conditions. Multiple explosions, massive land contamination, marine contamination, groundwater contamination, and that's the evidence. That's what we all witnessed.

But it doesn't stop there. The NRC's own general design criteria focuses on the containment design itself for this nuclear power plant. These two units. And that is general design criterion 16. And again, this is the NRC's own language. "Containment design. Reactor containment and associated systems shall be provided to establish an essentially leak-tight barrier against the uncontrolled release of radioactivity to the environment and to assure that the containment design conditions important to safety are not exceeded for as long as a postulated accident condition is required. The NRC knows that the Limerick Units 1 and 2 containment design is very likely to fail if challenged by a nuclear accident. In fact, the NRC's own staff in a paper prepared for the Commission, SECY-2012-0157, identifies that for the General Electric Mark II boiling water reactor at

13-2-OS Cont'd

Limerick, involving core damage, there is roughly a 50-50 chance of recovering from the nuclear accident within the pressure vessel with no significant reactor release from containment. That's their language. The flip side is that it's a 50-50 chance that the vessel will fail with a significant release from containment.

It goes on to say, this is the NRC staff that "if the vessel fails, there's a 25 percent chance that the operators might cool the molten core inside the containment with no significant release to the environment." Okay, the flip side of that is there's a 75 percent chance that they will recover, that there will be a release, a significant release. This is the NRC's own estimate of Limerick 1 and 2.

13-2-OS Cont'd

That said, NRC states there is an 11.8 percent chance that a severe core damage sequence will lead to early over pressure containment failure where there is a 90 percent chance the molten core will bypass the containment system, principally the suppression pool because it will burn through seals in the containment and there will be a catastrophic release of unfiltered radioactivity into the environment and to the population down wind. That's you. That's us. That's miles and miles and miles away. This is the kind

of gambling that the Agency and the industry are engaged in for the emolument of a few men. We don't need this plant to be operating at that risk.

13-2-OS Cont'd

In fact, this plant should not receive a license renewal and should be put into a phase out just on the fact that they are in violation of their license agreement. So the concern here is that we are not being provided a process that fairly evaluates the risk to the public health and safety and to the environment and in this instance NRC stands for the Nuclear Railroad Commission. Thank you.

(Applause.)

FACILITATOR BARKLEY: Okay, thank you, Paul. We have about 20 minutes left in the meeting and I have three speakers left to call. If there's anybody else who would like to speak, please come see me. The next person up is Alisa Otteni and that will be followed by Less Rinehart.

Alisa.

MS. OTTENI: Hello, there. I'm Alisa Otteni and as some of our previous speakers mentioned I wear multiple hats. Unlike some of you guys who have come three hours and thank you for coming three hours, I'm a local resident. I live in Chester Springs. I'm raising my kids here. I have three children at Owen

14-1-SR

J. Roberts School District which is a local school district. I am a trained certified environmental auditor. I have 25 years of international auditing experience. I've seen quite a lot out there, trust me. I have stories. But currently, for the last two years I have been employed by Exelon. I work for Corporate Environmental. I sit in the Kennett Square campus and I support and assist Limerick Generating Station.

Part of my job responsibility is to provide governance and oversight related to environmental complaints and make sure the site follows the environmental regulations and stays compliant. I believe the station has a very strong environmental program based on my history, my understanding of the rules and audits down by international, internal agencies. We get audited by more people than you've probably ever imagined with acronyms that I still cannot keep up with and I thought environmental regs had acronyms. I'm impressed with the staff at this plant. These staff are your neighbors. They work in this plant. They care about their own environment, just like I do. I live here. My kids go here. I care about where I live.

14-1-SR Cont'd

And some of the other stuff I do with them is on the side. My children come just like the other

woman said with her child. My kids take tours of the plant. They learn about how fission works and they learn about how a nuclear power plant works and they can talk conversationally about how Limerick works.

They help with the Boy Scouts and the Girl Scouts with building the trails and planting the pollinator gardens and bird houses. I also support the station, actually multiple stations with a Wildlife Habitat Council certification and the work that they do for that certification. And recently we started working with the Audubon Society.

14-1-SR Cont'd

So I'm pretty impressed and I'm here to say I support the Draft EIS renewal of the Limerick operating license. Thank you.

(Applause.)

FACILITATOR BARKLEY: Les.

MR. RINEHART: Thank you. I'm Les Rinehart. I own Potty Queen. I'm a local business. My business is located right in front of the power plant. We have absolutely no problems with the power plant. We're in favor of relicensing. I feel the same commitment they do as far as environmental safeguards. They do it every day. We see it. We see security there. We see if anybody is out snooping around in front there, they send security over right away. And

15-1-SR

they have a lot of systems in place that protect the people.

I have lived and worked in and around the power plant all my life. I've hauled trash out of there when I was in high school. When the facility opened up, I hauled trash out of there. Now many years later, I built my business right next door. I have 32 employees. None of them have any problems. Exelon is a great corporate neighbor. They're great for the neighbors there in the community. They do a lot for the community, donations and what have you.

We all use electric. We all turn the lights on at night. We all need it. If you look around, there was two local coal-fired plants that were closed down recently. So we need a source. And Exelon is a good source. The power plant does a great job.

15-1-SR Cont'd

Years ago, when I was in high school, nobody wanted to build a house around the power plant. Nobody -- they were scared. Now they're building right next to it. And the reason they're doing that is because they see the safety track record. They have a safety track record there. They don't have any problems. There's no incidence there that I know that would make me feel uncomfortable about going into work.

I drink the water every day. And I repeat,

I'm in favor of repermitting and thank you for your time.

15-1-SR cont'd

(Applause.)

FACILITATOR BARKLEY: Okay, thank you, Les. The last person who asked to speak was Chris Conroy and unless there's someone else who wants to -- Leroy Watters? I didn't see a card for you, but you're next. How's that? Right after Mr. Conroy, all right? We have plenty of time.

MR. CONROY: Hi, my name is Chris Conroy. I live in West Chester and I work for Exelon at the Limerick Station. I've worked for Limerick for about the past four years. And I do believe, based on my own experience that Limerick is operated in a way that's safe and protective of the environment. In my opinion, Exelon is a very good corporate citizen and operates the plant in an environmentally-responsible manner.

Through my job at Limerick, I've had a lot of contact with staff from various regulatory agencies that issue Limerick operating permits and do inspections at Limerick on a regular basis. The comments and feedback that I've received from these agency staff have shown me that the agencies really appreciate a company like Exelon at Limerick that takes environmental responsibilities and environmental

16-1-SR

compliance seriously.

16-1-SR Cont'd

I support the approval of the Draft Environmental Impact Statement for Limerick's license renewal application. Thanks.

(Applause.)

FACILITATOR BARKLEY: Come on up, Leroy. I don't know where your card went, but we're going to hear from you.

MR. WATTERS: Where's my card?

(Laughter.)

First of all, I like to speak anyhow so I get input on what everyone else thinks. And I like to make my stuff different. My name is Leroy James Watters III and I live on Schuylkill River in historic Fort Indiantown.

Now my love for the Schuylkill River probably is because it's my favorite playground since I was about nine years old. But it's also the source of my drinking water. The water comes out from behind the Norristown Dam in Norristown which is the county seat where Pennsylvania's water comes from. And the first introduction that I had with Limerick had to do with a committee of the Norristown Boat Club, we were concerned about them boiling off all the water. And I was involved with the DRBC rules and regulations back

17-1-GW

to the original ones. And what the DRBC does is it controls consumptive use because Limerick can burn off a lot of our drinking water. 17-1-GW Cont'd

Now I've been looking forward to doing something since the early '90s when I videoed a dissolved oxygen violation that basically killed all the clams from Limerick down because of the dissolved oxygen violation because of the temperature violation and a flow violation of the DRBC rules. 17-2-AQ

Now in '91 and '92, as a member of the Telephone Pioneers of America, I was the chairman of the Environmental Committee and we won awards for stewardship and that's when it began, when I saw all the dead clams and smelled what the problem was.

Now since that time with the help of my wife, Lynn, we've been able to acquire USGS documents of algae blooms. Now an algae bloom occurs when the flow of the river is less than 730 cubic foot a second, I think that is, and the temperature is above 79 degrees. Now those are the two rules that were in the original DRBC regulations. 17-3-AQ

Now the high impact problem of these algae blooms not only is the clam kills which are the canary in the coal mines that tell you when the next living thing dies, it has the impact on clogging the filters

in the water main, requiring around the clock monitoring. Now almost four decades I had with Bell Telephone, well, now it's called Verizon, I had an opportunity to be outside and witness a lot of environmental issues from sewer plants to well, we won't go there. But the fact is is that the last spill, excuse me, wrong meeting, this has to do with the algae blooms.

17-3-AQ Cont;'d

The last algae bloom which we have USGS documentation, I called the DRBC and complained about the condition. They referred me to the Delaware Estuary who referred me to the Corps of Engineers who are the ones that are responsible -- oh, excuse me, after explaining the problem with the Green River and the dying clams five times, I managed to get to George S., we'll call him George S. And what we accomplished is changing the flow from Beltzville to Blue Marsh to stop the blooming and also deal with the salt line in the Delaware River which is what the Army Corps of Engineers and the DRBC is responsible for.

Now the thing is is that I have a moral responsibility to share what I know and I intend, well, let me say this about that. I have put some stuff on YouTube that has fixed things. Now I have a very embarrassing video from July 7, 1991 showing this

condition on the Schuylkill River. I just may put this on YouTube.

Now in order to resolve these problems, we have to look at the environmental impact of the tornadoes and you want to get this one? I remember the tornado that came down and tore the roof of the NRC building in King of Prussia. Now I thought that was a real ha-ha. But I didn't think it was a real ha-ha from the baseball size hail that hit. Does anybody remember that?

Well, here's the thing. Fishing is down because it's affected the river. Something happened to all the aquatic plants that's in there. We have aerial photographs that document this. The Valley Forge Watershed Association which I'm part of, I'm on the Community Education and Outreach, that's why I'm outreaching out here to all you folks. 17-4-AQ

This came too fast for having official comments from the watershed, from the community afforded in the end, from the Norristown Boat Club and everybody else that's affected by the environmental quality of this river. I have that documentation.

I am not here talking idly. My career for almost four decades in the telephone company had to do with the truth and we will get to the bottom of this.

website regulations.gov and search for the docket ID listed on the slide. If you have any written comments today, you may give them to any NRC staff. This concludes our presentation and I'll turn the meeting back over to Richard.

FACILITATOR BARKLEY: Okay, thank you, Leslie. Are there any questions regarding the presentation? If not, I'll move right into the comment period.

Again, typically, we call elected or appointed officials first. And Michael Moyer is the first one who signed up. Are there any other elected or appointed officials who would like to speak this evening as well? If not, Michael, you're first.

MR. MOYER: Thank you for the opportunity to make my comments and I promise that I will keep them brief.

The NRC is guilty of regulatory capture in my opinion. Regulatory capture occurs when a regulatory agency created to act in the public interests instead serves to advance and to promote the agenda of the very industry it is charged with regulating.

Let me give you a very specific example. On September 14, 2012, I wrote the NRC to request a delay of final public hearing on the Environmental Impact

18-1-LR

Statement of relicensing the Limerick Generating Station until the NRC's U.S. court-ordered spent fuel study was complete. I never received a response. Not a phone call. Not a letter. Not an email. No response. 18-1-LR Cont'd

Recently, I called Congressman Jim Gerlach's office and I also called Senator Bob Casey's office for help in getting a response to my letter. I'd like to publicly thank Greg Francis from the Congressman's office and Kurt Imhof from the Senator's office for personally contacting the NRC on my behalf. Even after those efforts, and now some eight months after I had written that letter, I still haven't heard back from the NRC. And I suspect I never will.

This helps to illustrate a real-life example of how regulatory capture works. In this case, the regulatory agency in question seems to be more concerned, in my opinion, with keeping Exelon's relicensing of the Limerick Generating Station on track than they are with responding to the concerns to protect the public interest.

How is it in the public interest, for example, to attempt to assess the environmental impact of relicensing Limerick Generating Station when we don't know the results of the spent fuel study? And we won't know the results until some time in 2014. How can the 18-2-RW

NRC properly assess the environmental impact of relicensing Limerick Generating Station until the earthquake mitigation plans have been completed? And we won't know the results until some time in 2017. Why does the NRC seem to be in such a mad rush to relicense a nuclear facility when its license doesn't even expire until 2024? Why? Why? Why?

18-3-OS

18-4-LR

The answer is simple: regulatory capture. The Nuclear Regulatory Commission or better yet, the Nuclear Rubberstamp Committee, which is precisely what it appears to be in my opinion, is far more concerned with being directed by Exelon and Exelon's schedule than it is with responding to the health and safety concerns of the public. That's why today I am formally calling for a congressional investigation of the NRC's practices based on regulatory capture, regulatory malpractice, and willful abandonment of its charge to act in the public interest.

Further, as an elected official representing over 6,000 residents across the Schuylkill River in East Coventry Township, I am formally calling for a final public hearing here in Pottstown before the NRC grants any license renewals to Exelon for its Limerick Generating Station. Thank you. Thank you for your time and consideration.

(Applause.)

FACILITATOR BARKLEY: Okay, thank you, Mr. Moyer. Our next several speakers will be Mark Pavelich, followed by Dr. Ann Baly.

MR. PAVELICH: Good evening. My name is Mark Pavelich. I own a business called Organics and I operate it and live in Dowington. I'm extremely passionate about issues that relate to the environment as my company develops, manufactures and deploys materials in organic horticulture. 19-1-SR

Thus, I'm in the forefront of environmental issues daily. And I do support the relicensing of Limerick Generating Station. Thank you.

(Applause.)

FACILITATOR BARKLEY: Okay, thank you, Mark. Dr. Baly.

DR. BALY: I'm Anita or Ann Baly. I'm mostly retired, former Lutheran pastor and professor of theology. I'd like to comment on one specific environmental issue and one more fundamental question. And first, I just want to publicly thank the Pottstown Mercury and Evan Grant, in particular, for the continued and on-going and careful reporting that has been done on this whole Limerick nuclear plant issue in our community. Otherwise, most of us would know very little about it.

Environmentally, I am concerned about evacuation. Now I just learned tonight that evacuation, alas, falls into another unit of the NRC's portfolio. But since the professed number one mission of the NRC is to protect the public health and safety and because I don't know whether that other unit will ever invite public comment, I would like to speak briefly to evacuation tonight. 20-1-OS

I am in my mid-60s. I am healthy, mobile, resourceful, informed, and well educated. I believe my chances of successfully evacuating in the event of a nuclear disaster are slim to none. I live a mile from the plant at the Sanatoga Ridge Retirement Community. I believe the chances of my neighbors evacuating successfully, most of my neighbors are in their 80s or 90s, I think their chances could be described as simply not having a prayer.

To pretend otherwise seems like a cruel hoax. Any previous hopes that people would be evacuating only in a ten-mile area, it seems to me, have been definitively answered and dashed by the actual human behavior we saw at Fukushima during their nuclear disaster. People evacuated within a 50-mile area and they had to.

When nuclear disaster strikes at Limerick,

people will be evacuating all over the greater Philadelphia area and into New Jersey. Millions of people, all competing in a panic mode for the same roads that serve us so poorly around here during an ordinary rush hour. And it can only get worse because daily the population increases.

20-1-OS Cont'd

But environmental impacts, crucial as they are, are secondary questions. I really wish someone would address why this licensing procedure is happening so early. Unit 2's present license, as Mr. Moyer explained, isn't even up for 16 years. Only God knows what will happen tomorrow, let alone 16 years from now. We will be learning that only as we go along.

20-2-LR

Think back just 12 years ago. Remember those days, the spring of 2001? I still enjoyed flying in airplanes. I had no sense that the United States in the contiguous 48 states could be attacked by anyone. Our economy was robust, employment was full, interest rates were high. I hadn't even heard of email. Our general feeling in America was that of happiness and safety. Well, all that has changed.

Much will happen in the next 12 years that no one can foresee. To proceeding with licensing now makes no sense. It almost seems as though the NRC is saying to us our mind is made up. Do not confuse us with

20-3-LR

any present or future facts, circumstances, insights, developments, or technologies.

20-3-LR Cont'd

Someone must be profiting by this reckless rush to relicense, but the public is being harmed by the haste. You, Nuclear Regulatory Commission, have the power to change this. Please, slow the process down. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Ann. Our next speaker is Gail Brown, followed by Donna Cuthbert, and then Leanne Birkmire.

MS. BROWN: My name is Gail Brown. And my neighbor is the Limerick Generating Station. I live a short distance from Frick's Lock National Registered Historic District. About two thirds of this district is within the exclusionary boundary, right on the cusp of the Limerick Generating Station, therefore, uninhabited.

21-1-HA

Greatly due to increasing vandalism and a fire at the Lock Tender's House in February 2008, the Frick's Lock stakeholders were formed to negotiate a satisfactory resolution towards the preservation of Frick's Lock. The stakeholders were represented by members from Exelon, the Schuylkill River Heritage Area, East Coventry Township, Chester County, Senator Breneman

and Preservation Pennsylvania, and the Pennsylvania Historic and Museum Commission.

On February 14, 2011, Valentine's Day, an agreement between Exelon and East Coventry Township was accepted to rehabilitate Frick's Lock. Construction began and was completed the following year 2012. The first public tour of Frick's Lock Historic District is scheduled for June 8, 2013.

21-1-HA Cont'd

I believe this is the first time a major utility has rehabilitated a National Historic District in negotiated terms to allow a local historical commission limited access to conduct guided tours within the EAB. Not only did this project enrich the history and heritage of our community, but Frick's Lock also lies adjacent to the proposed Schuylkill River Trail and as a trail head will be a tourist destination and a boost to our local economy.

As a member of the Frick's Lock stakeholders, I am still amazed at what can be accomplished when a large corporation, Exelon, is willing to come to the table and work with individuals and a community to contribute to and enhance our resources. Thank you, Exelon, and I look forward to a continued participation within the Frick's Lock stakeholders.

(Applause.)

FACILITATOR BARKLEY: Here you go, Donna.

MS. CUTHBERT: For an agency mandated to protect public health from Limerick nuclear plant operations, NRC's mindset and insistence on repeatedly denying reality is intolerable. NRC's denial protects Exelon's profits and NRC jobs, but they allow more people to become tragic victims of Limerick nuclear plant's radiation and other toxic releases.

Sadly, NRC is infested with conflicts of interest which are leading to lies that will further jeopardize everyone in our region.

NRC obviously ignored documented evidence of environmental and health harm, compiled and submitted to NRC for this EIS in 2011 by ACE. This evidence should have been alarming even to NRC.

NRC did no monitoring or testing. In reality, NRC has no idea how much radiation is released from Limerick. Based on flawed and outdated theoretical models for radiation exposure which only measure external doses and ignore internal doses, NRC shamefully, shamefully continues to absurdly claim Limerick radiation releases are safe. Permissible does not mean safe. 4-13-RW

In 2005, the National Academy of Sciences, 4-14-HH

BEIR VII Report said there is no safe level. Dr. John Gofman, once head of AEC's labs raised dire warnings about permitted releases from nuclear plants. He published research warning about permitted releases from nuclear plants. He estimated 32,000 Americans would die each year from fatal cancers induced by allowable radiation releases. Gofman said the entire nuclear power program is based on a fraud that there is a permissible dose that wouldn't hurt anyone. And frankly, we're tired of hearing NRC people say that.

4-14-HH Cont'd

We provided NRC with evidence showing communities around Limerick already exacted a high public health toll since Limerick started operating. A cancer crisis has been documented by Pennsylvania cancer registry statistics and CDC data. Cancer rates skyrocketed far above the national average after 1985 when Limerick started releasing radiation into our air, water, soil, and people. Links to Limerick are clear. Limerick routinely releases radiation. Radiation causes cancer. We have a cancer crisis and one of the largest relays for life anywhere.

The upward trend in childhood cancer rates provides the most tragic link. By the late 1980s, childhood cancer rates climbed to 30 percent higher than the national average; higher by 60 percent in the early

1990s and a shock 92.5 percent higher than the national average in the late 1990s. Infant and neonatal mortality rates are far higher than the state average and even higher than Philadelphia and Redding. Studies provide a link.

4-14-HH Con'td

When nuclear plants open, infant mortality rates go up. When they close, rates go down. Autism rose a whopping 310 percent from 1990 to 2000. Learning disabilities increased by 94 percent, a rate double the state increase. Strontium-90 radiation is an undeniable link. Limerick releases strontium-90. It's in our air, water, and soil. Strontium-90 is also documented in the babies' teeth of our children at some of the highest levels in the nation. NRC still shamefully tries to blame decades old bomb testing far from our region. It's ridiculous.

Many cancers rose dramatically by the late 1990s. Examples include thyroid cancer, 128 percent increase; multiple myeloma, 91 percent increase; breast cancer, 61 percent increase, higher than the national average in every age group and it is 51 percent higher in women 30 to 44. There's a 48 percent increase in leukemia, almost double the state average.

Limerick nuclear plant is clearly a major factor in the tragic and costly health crisis around it

with children the most profoundly impacted victims. Exposure to Limerick's radiation is an unavoidable and intolerable injustice. We can't see it, smell, taste, or feel it, but it's everywhere. We can't avoid it.

4-14-HH Cont'd

As long as Limerick nuclear plant continues to operate, radiation and other dangerous toxics will be released into our air and water and more people will suffer needlessly. We have lost patience with NRC's lies, coverups and negligence. NRC should close Limerick now to protect public health. It's time to stop unnecessary exposures and associated suffering and healthcare costs due to Limerick's operations.

(Applause.)

FACILITATOR BARKLEY: Thank you, Donna. Leanne. And Tina Daly is next.

MS. BIRKMIRE: Good evening. My name is Leanne Birkmire. I live in Jeffersonville, Pennsylvania. I'm a chemical engineer by trade and I've worked for Exelon for nine years. The past four have been at Limerick Generating Station. My group is responsible for monitoring of the air, water, land, waste, chemicals, tanks, and wildlife in accordance with state, local, and federal regulation.

I'm also the lead of the Environmental Stewardship Committee at Limerick Generating Station, a

group of approximately 30 volunteer employees who participate in conservation efforts both at the station and in their communities.

I believe that Limerick is safe both in its design and in that the employees come to work every day recognizing that nuclear technology is special and unique. I believe that Limerick is operated in a manner that protects the environment and that conservative decisionmaking is used at the station to ensure that we protect the plant, we protect the workers, we protect the public, and we protect the environment for future generations.

22-1-LR

I support the approval of the Draft Environmental Impact Statement for renewal of Limerick's operating license. Thank you for your time.

(Applause.)

FACILITATOR BARKLEY: Tina's next. Followed by Charlie Shank.

MS. DALY: My name is Tina Daly. I live within ten miles of Limerick. I have been following the process since the days of the Limerick Ecology Action. I was one of two citizens who commented on the latest air permit, so I won't get into that tonight, and one of the very few who commented on the NPDES permit, also I won't get into that.

I also spent years worrying over the DRBC water augmentation request that dedicates the Schuylkill River to the production of nuclear power. I am opposed to the relicensing and I believe this plant should be safely decommissioned as soon as possible and with full on-the-record public participation at every step.

23-1-SW

23-2-OR

The DSEIS is completely self serving and shows how far NRC is in bed with Exelon. Nuclear regulatory means regulate. NRC is paid for by all of us and should be fair and impartial. It is strange that the NRC wrote the DEIS. The NRC set up the interior rules, including small, moderate, and large -- what a brilliant idea -- and whether something is new or old. And the NRC will decide whether or not to relicense. What a farce. This is not the way to make decisions.

23-3-LR

The public notice was not informative in the least. Obviously, NRC is not interested in public input. The notice appeared on 5/9/13 and today is two weeks later. I, for one, cannot adequately review this document in that time frame. However, I do thank the NRC for making the paper copies available on request.

23-4-LR

This is a meeting that's being transcribed. Are we on the record as we would be at a hearing? Is NRC on the record? I agree with Mr. Moyer, the supervisor, that there should be an on the record public hearing.

23-5-LR

NEPA Section 1502.2(f) says agencies shall not commit resources prejudging selections of alternatives before making a final decision.

23-5-LR Cont'd

On page 123 of this document it says "the USNRC preliminary recommendation is that the adverse environmental impacts of license renewal for LGS are not great enough to deny the option of license renewal for energy planning decision makers." I think the NRC is not in compliance with NEPA and I think this needs to be looked into. I think the law is being broken.

Throughout the supplemental, we are told that there is no new information to change the past EIS and decisions. The fact is there are lots of new pieces of information. One of the new pieces Donna mentioned is the National Academy's National Research Council BEIR VII No. 2 Report which says there's no safe level of exposure to radiation. This is new since LGS started up. It is not considered here. I couldn't find anything about it in the document that I was given. It must be considered because of all of the reasons Donna said.

23-7-HH

Most of the maps are no good. Quickly, show me the star on page 2-3. Show me the township names. What is the location of the business shown on page 217, etcetera. Some of the maps have circles around the plant

at varying distances, so of course, you can't compare them.

I looked at all the references they used. The references include work by private firms for corporations as far as I can see. Who paid for these studies? Where did the money come from? It seems that NRC did not use work done by such organizations as the Union of Concerned Scientists, Beyond Nuclear, or ACE. This is an example of how NRC is in bed with one side.

New also is the above-ground storage of spent nuclear fuel. That certainly wasn't here before and that certainly presents a huge danger to us all. And I might add the public hearing on that was held in the context of whether they could put cement pads in a certain zoning district. 23-8-RW

New rules about spent fuel may be released in 2014, so this relicensing is obviously premature.

The whole document is full of things like the term "permanent disposal." There is no such thing as permanent disposal. Also, there's a reference to corporate wildlife habitat certification. It's just one of the references on one of the lines. This certainly throws all those references about wildlife into question to say the least. 23-9-TE

Historic resources, Frick's Lock aside, 23-10-HA

don't include some of the places that I know are on the Historic District and it also said that there were no federal lands owned in the 50-mile radius except Valley Forge. Maybe the Independence National Park isn't nationally owned. I don't know. Hopewell Furnace, the Heinz National Wildlife Refuge, I question that. 23-10-HA Cont'd

Also federal money is being spent on the Highlands. NRC is a lackey to the nuclear industry and NRC should not consider this premature license application and its circular arguments. NRC should be reorganized into a non-biased, regulatory commission prior to any further decision making. I plan to extend these remarks before the deadline is over.

(Applause.)

FACILITATOR BARKLEY: Thank you, Tina. Charlie. Then Paul Gunter is up.

MR. SHANK: Before I start, I just want to thank again Mr. Moyer for coming over and making his comments. He seems to be the only one who is aware of the potential dangers over there in East Coventry accepting that land. Recently, the Limerick nuclear plant refueled Reactor 1. It also uprated the plant to produce more energy. To do this they have mixed in a more powerful fuel, GNF2, and changed the shape of the fuel bundles. These changes make more power, more 3-2-OS

radiation, more heat, and more stress on the aging equipment. Exelon is now close to the maximum output for the Limerick reactors. To add more power, expensive changes would be necessary to handle even greater stresses and greater radiation.

3-2-OS Cont'd

Every day, 14.2 million gallons of very hot water leave the cooling towers loaded with dissolved solids and radiation. This hot brew goes down Pipe 001 to the diffuser and into the Schuylkill River. It enters the river at 110 degrees Fahrenheit a much higher temperature than the Schuylkill River limit of 87 degrees Fahrenheit. Over the course next 30 years, that will amount to about 150 billion gallons of polluted water going into the river.

3-3-HH

When water is hotter than 95 degrees Fahrenheit it fosters the growth of thermophilic microbial organisms. These organisms include legionella, yes, legionella, and salmonella among others. These pathogens thrive in warm water. They can also cause fatal infections and pneumonia in compromised individuals and the elderly. This hot water needs to be cooled down more than it can be at the present time.

3-4-HH

Exelon asked the Pennsylvania Department of Environmental Protection to provide comments about these pathogenic organisms in the river. Exelon wanted the PA

DEP to confirm Exelon's conclusions that no harm would come from the pathogens during an extended period of operation with these higher temperatures. The Pennsylvania DEP, to its credit, said it had no data on these organisms in the river to support Exelon's claim. The PA DEP was unable to reach any conclusions as to the possible health effects, thus, not supporting Exelon's contentions.

I think it would be better to have more independent study done now than solve any unknowns before racing to relicense Limerick. We have 11 years remaining in the present license period to properly work out these problems. We should not just skip over them or wait until a serious accident happens. The job of the NRC is to promote public safety, not the nuclear industry. The way the NRC has been acting lately, makes the IRS look good. 3-5-LR

I support ACE's recommendations about the Senate investigation of the NRC and about having a public hearing here for relicensing back in Pottstown.

Lastly, I want to mention how Exelon and the agencies like the NRC are destroying public trust. This isn't something that just happened over night. It's been coming on for many, many years. For one thing, they eliminate. They eliminate proper temperature controls 3-6-SW

and heat standards for the Schuylkill. They allow dirty Wadesville water into the Schuylkill. They grant radiation exemptions. They grant total dissolved solid exemptions. They ignore Clean Air and Clear Water Act. They delay timely notification of the public about accidents and spills. They alter the river flow rate measurements for convenience. They allow 20 time increase in pipe leakage rates for Limerick so it can pass a test. They stall fuel pool liner repairs. They stall protective vent installation. They fail to require filters for the vents. They misled Limerick construction costs. Deceived. The NRC inspectors had been instructed not to write things down on paper so they won't show up in FOIA requests.

3-6-SW

3-7-SW

3-8-OS

Secrets. They withhold Exelon information from the public concerning foreign ownership or investors. My favorite, the evacuation plan. The NRC requires this plant for relicensing, they pay for it, Exelon does, and then everybody ignores it.

Among some of us, we think of this plant as a dinosaur. To me, the industry is dying, but they just don't want to admit it. We call it nukesaurus. Our country is smarter than this. Because of corporate greed and control, they have taken over this business and this relicensing. We should start over with a fresh

sheet of paper. The rest of the world is moving ahead while we tread water. We can do better than this. We can certainly do better than what we're doing now. Thank you very much.

(Applause.)

FACILITATOR BARKLEY: Paul, after you will be Zach Chizar.

MR. GUNTER: Thank you. My name is Paul Gunter. I'm Director of the Reactor Oversight Project at Beyond Nuclear in Takoma Park, Maryland. And I drove up here tonight basically with the message that the relicensing of the Limerick plant is more than just a local issue.

The concerns here are far reaching and I think that the story that I wanted to bring to start off with was the concern is how can you do an accurate Environmental Impact Statement if in the midst of trying to figure out just how far the reach of the Fukushima Daiichi nuclear accident really is and in terms of its impact on land contamination, air, water, and marine environment contamination by radioactivity from this accident?

13-4-OS

And so it's our recommendation, our request, that this relicensing be suspended until there's a more reliable reviewable Environmental Impact

Statement that tells us what's the results from Fukushima Daiichi and the nuclear catastrophe that happened at the GE boiling water reactors there similar to those here. 13-4-OS Cont'd

At Fukushima Daiichi, it was General Electric Mark I boiling water reactor for Units 1 through 5 and Unit 6 is a Mark II, like Fukushima Daiichi. And I'm going to recall a story. On March 11, 2011, I was called into CNN in Washington, D.C. to comment on the accident that was emerging at the Fukushima Daiichi facility and I was asked by correspondent Jean Mazur to just briefly say what is your concern as simply as you can put it. And what I said and what was on The Situation Room report for that evening was our concern is that this reactor could literally blow its roof off.

And that remark was contrasted by Tony Pietrangelo with the Nuclear Energy Institute that said there's no evidence that there's any threat to containment. What proved out the next day was the explosions that then repeated themselves. And it wasn't a prediction on our part. It was never a prediction, but it was the fact that we've known, I've known for decades, that these GE boiling water reactors are unreliable in terms of their primary component for protecting the public in the event of a severe accident, that being the containment structure.

contention that if you're wondering why Exelon is making its application so early, it's one of our contentions that the industry and the agency have colluded to avoid answering questions about the lesser environmental impact from the on-coming renewable energy renaissance, revolution that is happening, that is attracting investment and is growing by leaps and bounds. The NRC doesn't want to make that kind of information in its Environmental Impact Statement. That's why -- that's precisely why Exelon or any of these other utilities can make application as early as 20 years. That's the rule.

13-5-AL

13-6-LR

I mean what kind of Environmental Impact Statement is worth anything if it's fixed 20 years before the federal action is even required? This gives you the basic plan and blueprint for a bias that this Agency and this industry have concocted to expedite these license extensions prior to what they view as a lot of unwelcome and unnecessary questions about renewable wind, solar, energy efficiency, and whole host of 21st century energy policy chances that are going to happen, that are happening. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Paul. Is it Chizar?

MR. CHIZAR: Chizar.

FACILITATOR BARKLEY: I butchered it really bad. Dr. Cuthbert, you'll be up next.

MR. CHIZAR: Hi. My name is Zach Chizar and I'm an administrator with the Pennsylvania Energy Alliance. Day in and day out, we educate Pennsylvanians about nuclear power as a clean, safe, and reliable source of energy for the future. One of the most rewarding parts of working with this coalition is getting out into the community to meet different people, so many of whom already support nuclear energy. 24-1-SR

In early April, we were in this very room for Representative Mark Painter's Live Well Expo. Many attendees came by our table to learn about us and some even shared stories about Limerick Generating Station dating back to its origination when it was first opened.

Over the last six months, we've had two groups of fourth grade students from Brooke Elementary and Limerick Elementary nearby visit Limerick Generating Station. Nuclear energy is part of their current curriculum in school and the visit served as a perfect wrap up for the unit. The students were actively engaged and many asked great questions about the facility some of which were even interested in how to work there when they were older.

In addition, we were also present at the

community information night that was held last week at Limerick Generating Station. Community events such as this continue to show that results from our March 2012 poll still hold true that the public opinion of nuclear power is still very strong and positive near our State's five power plants.

24-1-SR Cont'd

As the need for energy continually increases, nuclear power proves to be the most reliable and environmentally friendly solution. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Zach. After Dr. Cuthbert, will be Betty Shank and then finally Lorraine.

DR. CUTHBERT: Thank you, Rich. Throughout this Environmental Impact Statement that has been drafted and presented by the NRC, the Agency has persistently and continuously understated, minimized, or denied the documented evidence of harms from Limerick nuclear plant.

Your pro-nuclear industry bias is well established, but it's also shameful at the same time. We reviewed the document in its entirety and I will refer to just a few items that illustrate the points that we make on behalf of protecting the public.

In Section 9.3.1 of your EIS you admit that

"during nuclear power plant operations, workers and members of the public would face unavoidable exposure to radiation and hazardous toxic chemicals." Despite this fact, NRC has actually suggested in this repugnant EIS that all of the environmental harms from Limerick are small. I'm going to repeat, all of the environmental harms from Limerick are small and have no measurable impacts. 2-12-HH

Nuclear power plants are the only facilities on the planet with the capability of rendering entire regions uninhabitable for decades, if not centuries, in the event of a radiation disaster. For NRC to claim that all power generating facilities generate similar wastes is another lie. You stated "the generation of spent fuel and waste material including low-level radioactive waste, hazardous waste, and nonhazardous waste would also be generated at non-nuclear power generating facilities." Really? 2-13-RW

NRC staff also concluded that cumulative impacts from Limerick's license renewal would be small in all areas except aquatic ecology and terrestrial ecology. That conclusion is patently absurd. You arrogantly and irresponsibly dismiss the harms, risks, and threats from Limerick as callously as you consider the members of our community to be merely acceptable 2-14-CI

collateral damage. You should be ashamed.

Even more astonishing than that, NRC staff concluded that continued operation of Limerick nuclear plant would have less environmental impacts than either solar or wind alternatives on air quality, groundwater, surface water, human health and aesthetics. Such conclusions are beyond untenable and unscientific. They bring new meaning to the term hubris. These ludicrous conclusions by NRC are laughable. And yet, they may not be sufficient to reject the Limerick EIS as having zero credibility. 2-15-AL

In Section 9.3.2 of your EIS Exelon claims "after decommissioning these facilities, and restoring the area, the land could be available for other productive uses." This is a delusional conclusion, worthy of no less than four Pinocchios. This is the same land that Exelon claimed was worth zero when it fought to avoid paying its fair share of property taxes for years. 2-16-DC

Consider this alternative. The only acceptable use of this site after decommissioning to members of our community would be as a regional NRC office. NRC has utilized their checklist mentality, referred to earlier, through other testimonies.

As an approach throughout this EIS,

Limerick's evacuation plan is a perfect example of the checklist mentality. Exelon was required to have an update to its plan on file with NRC no later than 2011. The document was finally submitted to NRC in December 2012. Analysis of that document, Exelon's evacuation time estimate, ETE, for Limerick nuclear plant's plume exposure pathway reveals that that update is based on unrealistic, unworkable suppositions, assumptions, inconsistencies, inaccuracies which we have enumerated, and illogical conclusions. NRC refused repeated requests to meet to review our detailed analysis of Exelon's fatally-flawed report. 2-17-OS

Even more shocking than that, was the admission by NRC officials that they had no need or intention to review, evaluate, or approve Exelon's ETE. The report was turned in, checked, good enough.

Well, not for us.

Every elected official in this region should be outraged. Exelon's ETE should be summarily rejected by elected officials and the NRC for that matter. This EIS for Limerick nuclear plant is nothing less than an insult to our community. Unsupported conclusions appear to fit your predetermined decision to use your infamous rubber stamp and approve an EIS that will facilitate relicensing of Limerick.

The narrative simply does not comport with reality or documented facts in many areas. This biased EIS is invalid, detached from reality, and unacceptable. You can do much better. NRC has now lost all credibility in the eyes of this community. It is painfully evident that NRC is becoming a cowardly agency, unwilling to implement or enforce minimal protection of the public, despite readily available scientific evidence and well-documented harms.

Sadly, you choose to be a subservient lapdog to the nuclear industry and their lobbyists rather than a vigilant watchdog protecting public interest. Only willful blindness could explain this EIS for Limerick nuclear plant which is nothing less than a white wash of epic proportion.

It is our conclusion and recommendation that the United States Senate should investigate the NRC for wilful blindness and regulatory malpractice and disallow or forbid all permitting decisions for Limerick nuclear plant until all unresolved findings, legal issues and recommendations from NRC's own staff are finalized and implemented.

And finally, ACE is again formally requesting that NRC hold a public hearing in Pottstown to address all of the relicensing issues for Limerick

20-18-LR

nuclear plant not specifically or adequately addressed in the environmental impacts. Our community deserves nothing less. 2-18-LR Cont'd

(Applause.)

FACILITATOR BARKLEY: Thank you. Betty? And finally, Lorraine after her.

MS. SHANK: I have read NRC's safety evaluation reviews of Limerick and inspections and notices of violations. NRC inspectors, to their credit, do a good job identifying problems and citing violations, but somehow they get whitewashed by the time violations are issued.

Maybe what the public needs is what is done for Exelon. A cost-benefit analysis. If it got one, the result would show how indefensible Limerick license renewal is. NRC's job is to protect the public. But it has never acknowledged the astronomical costs and the lack of benefits for the public that results from Limerick nuclear operations.

As taxpayers and ratepayers, the public does not benefit from Limerick nuclear energy because Exelon makes its enormous profits while the public pays the lion's share of its business costs in one of the biggest corporate welfare schemes ever. 5-5-SE to 5-4

Public costs include construction costs

the enormous costs skyrocketed and were attached to electric rates that climbed to a whopping 55 percent above the national average.

5-5-SE Cont;d

Property and school taxes, Exelon refused to pay its fair share for years. Eventually, a settlement was reached and Exelon now pays around $3 million a year. But that's a pittance compared to the $17 million it should have been paying each year all along.

5-6-SE

Avoidable diseases, cancers and other illnesses in this region are much higher than the national average and are linked to Limerick's radiation. The cost for one six-month-old child treated for just two years who has cancer is over $2 million.

5-7-HH

Water contamination. Limerick's toxic and radioactive waste water discharges cost water companies and their customers more money. Exelon should filter to protect public health and protect the water companies and the people who use their water downstream

5-8-SW

High-level radioactive waste storage. Tons are produced at Limerick every year, remaining deadly virtually forever. The public cost is in higher taxes. And we are charged for it to be stored at Limerick.

5-9-RW to 5-8

Decommissioning. That's funded through

5-9-DC

hidden charges in our electric bills and through miscalculations, deliberate or not, on Exelon's part, $100 million will be needed for Limerick which Exelon wants ratepayers to fund. Exelon makes mistakes, but we pay for them. 5-9-DC Cont'd

Exelon hands out donations like candy with one hand and picks our pockets to do it with the other. Its contributions to this community are paid for by us. It's pennies on the dollar for Exelon and the cost to the public are incalculable.

I do not support NRC's decision to relicense Limerick or understand why it is rushing to do so. And I fully support the Cuthbert's recommendations that come from ACE and that are calling for a renewed look at this problem. Thank you. 5-10-OR

(Applause.)

FACILITATOR BARKLEY: Lorraine and if there's anyone else that would like to speak, please come see me.

MS. RUPPE: Hi, my name is Lorraine Ruppe and I live in Pottstown. How can NRC believe Exelon's outlandish claims that they are stewards of the environment when, in fact, evidence shows Exelon is damaging the environment every day Limerick operates.

Common sense tells us nothing in the world

threatens our environment and our health more than Limerick nuclear plant operations. We shouldn't have to live with radiation, other toxics poisoning our water and bombarding our children because of Limerick nuclear plant operations. We shouldn't be faced with the depleting water supply because of Limerick's cooling towers or risk having no water if Limerick has an accident or a meltdown. Our drinking water could dry up or become so radioactive we can't use it. 7-7-GW

Exelon pumps toxic minewater into the river up to 80 times safe drinking water standards. The toxics don't magically disappear. They end up in our drinking water. And manganese, one of the toxics can lead to permanent brain damage from showering. 7-8-HH

NRC dismissed serious threats to public drinking water from Limerick nuclear plant. NRC met with DEP and DRBC, but they just gave Limerick five-year permits to use and pollute our drinking water with dangerous loopholes and exemptions because Limerick can't meet safe drinking water standards or other protected limits. That didn't reduce our risks. 7-9-GW

Exelon should have been required to filter Limerick discharges and those from the minewater to protect our drinking water and public health. Limerick causes irreparable and irreversible damage to the river

and then donates to a fund deceptively claiming they protect the river. Not one dime of that fund was ever spent to reduce Limerick's radioactive or other toxic discharges.

7-9-GW Cont'd

Exelon's donations are a drop in the bucket compared to their profits and tax avoidances. Sadly, organizations hoping to get funding from Exelon ignore Limerick's poisoning of our water and children.

How can we take care of our health when we are forced to drink, bathe in, and breathe in toxic chemicals from Limerick operations every day? Too many people are really sick, have thyroid problems and are dying of dreaded disease like cancer.

7-10-HH

Look at the huge cancer rallies in our community. Why should we risk our lives and fear meltdown, more sickness, cancer from Limerick's electricity when safer energy is available. The problem is NRC appears to be more of a salesman than a policeman.

Nuclear power already destroyed parts of the world. This dangerous dinosaur technology must make way for safe, clean energy alternatives that won't destroy our water supplies and our health. Thank you.

(Applause.)

FACILITATOR BARKLEY: Thank you, Lorraine.

Okay, at this point we have a little more

PUBLIC SUBMISSION

As of: May 17, 2013
Received: May 16, 2013
Status: Pending_Post
Tracking No. 1jx-85cx-q0po
Comments Due: June 27, 2013
Submission Type: Web

Docket: NRC-2011-0166
Notice of Receipt and Availability of Application for Renewal of Limerick Generating Station, Units 1 and 2 Facility Operating License

Comment On: NRC-2011-0166-0049
Exelon Generation Company, LLC, License Renewal of Nuclear Plants and Public Meetings for the License Renewal of Limerick Generating Station, Units 1 and 2

Document: NRC-2011-0166-DRAFT-0047
Comment on FR Doc # 2013-10788

5/7/2013
78FR26663

Submitter Information

(1)

Name: Marvin Lewis
Address:
3133 Fairfield St.
Philadelphia, PA, 19136

General Comment

To the Commissioners and Chairman,
These are comments specific to the licensing of the of the Limerick Generating Station for an added 40 years. My interest is that I live in Philadelphia and do business in the area of LGS. In an accident scenario, I shall have to give aide and succor to escapees from the emergency planning zone.
My principle problems with the extension of this license concern the newly discovered facts which show that the original basis for allowing nuclear power are just plain wrong or used in an inappropriate manner. These original basis include , but are not limited to, probable risk assessment, prediction of health effects, and design of nuclear power plants. 25-1-PA

1. P. R. A. Probable risk assessments are used to emphasize the
likelihood that the plant will survive for a specific period. PRA demand the conclusion that enough plants operating long enough will suffer a devastating and 'beyond design basis accident.' The public does not see the dark side of the PRA analysis!
The accidents at TMI#2 and Chernobyl and Pleasantville (AKA Fukushima) demonstrate the above.

2. The recent discoveries concerning epigenetics put the past predictions of health effects on future generations into grave doubt. The predictions based on Mendel's observations do not nor were meant to predict neotany due to genes being switched on or off by uncontrolled radiation. 25-2-HH

3. The design of nuclear power plants is deficient on its face.
A. Nuclear power plants were originally designed to store 40 years of spent fuel on site! Due to low burn up (fuel produced less energy that originally predicted before failure), spent fuel pools could not meet the storage need for 'low burn up fuel failures.'
B. In 1979 the commenter won a 'pro se' contention on 'filters' ('Lewis Contention') at the NRC ASLB TMI #1 Restart Hearings which required the licensee to upgrade its filters. The licensee agreed, and commenter heard nothing. 25-3-OS

PUBLIC SUBMISSION

As of: May 17, 2013
Received: May 16, 2013
Status: Pending_Post
Tracking No. 1jx-85cy-uimf
Comments Due: June 27, 2013
Submission Type: Web

Docket: NRC-2011-0166
Notice of Receipt and Availability of Application for Renewal of Limerick Generating Station, Units 1 and 2 Facility Operating License

Comment On: NRC-2011-0166-0049
Exelon Generation Company, LLC, License Renewal of Nuclear Plants and Public Meetings for the License Renewal of Limerick Generating Station, Units 1 and 2

Document: NRC-2011-0166-DRAFT-0048
Comment on FR Doc # 2013-10788

5/7/2013

78 FR 26663

(2)

Submitter Information

Name: Marvin Lewis
Address:
Philadelphia, PA, 19136

General Comment

25-4-HH

Back when I was a child, the radiation background was reported as 60 millirems per year. The background is now reported by the DoE and EPA as 600 to 700 millirems per year.
Long ago, the background was 600 or 700 millirems per year. When the background radiation fell to 600 or 700 millirems per year, life on this Earth proliferated with a profusion of species and animals as never before. Evolution ran rampant. We are faced with a background dose that may make mankind an endangered species. The time to stop dumping radiation into the air , water and soil is past. Stop now!

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LTP1)

5/7/2013
78FR 26663
4

Mendiola, Doris

From: Kelly Jameson <keljameson@yahoo.com>
Sent: Friday, June 14, 2013 8:20 AM
To: Perkins, Leslie
Subject: Fw: Limerick Nuclear Plant DRAFT EIS

Limerick Nuclear Plant Environmental Impact Statement
NUREG-1457, Supplement 49, Docket ID NRC-2011-0166

NRC ignored and/or dismissed the hundreds of pages of ACE written EIS testimony presented to NRC October 2011, documenting through permit reviews, records from NRC's own files, PA Cancer Registry data, and other state health statistics, Limerick's unprecedented threats and harms to our region and its residents. 26-1- LR

✓ **ACE officers and others testified at NRC's 5-23-13 public hearing on Limerick's Environmental Impact Statement. To Review Testimonies See: www.acereport.org.**

Alliance For A Clean Environment (ACE) members reviewed and analyzed NRC's 585 page DRAFT Environmental Impact Statement (EIS) for Limerick Nuclear Plant. It is a disgraceful whitewash of Limerick Nuclear Plant's radioactive contamination of us and our environment, of major toxic chemical contamination of our air and water from Limerick's cooling towers and other sources, and of Limerick's unprecedented threats to the drinking water supplies for millions of people across six counties, as well as the Schuylkill River ecosystem.

Limerick released radiation into our air and water since 1985. Even though we can't see, smell, feel, or taste it, it's everywhere. Exposure to Limerick's radiation is an unavoidable injustice. 26-2-RW

Don't be fooled! 'Permissible' doesn't mean safe. The National Academy of Sciences BEIR VII report (2005) said there is "NO SAFE DOSE".

Dr. John Gofman, former Atomic Energy Commission chief, raised dire warnings about permitted radiation releases from nuclear plants, publishing research showing an estimated 32,000 Americans would die each year from fatal cancers induced by "allowable" radiation releases. Gofman said, "The entire nuclear power program is based on a fraud, that there is a permissible dose that wouldn't hurt anyone." 26-3-HH

Cancers skyrocketed after 1985, when Limerick started releasing radiation into us and our environment. Shocking cancer rates are documented far higher than the national average, especially in children, with data from the PA Cancer Registry and CDC website. ACE cancer mapping is alarming. Our relay for life is one of the largest anywhere. Limerick's radiation releases are obviously a major factor.

Limerick is a major air polluter under health-based standards of the Clean Air Act, releasing so much cooling tower PM-10, that Limerick needed a 6-fold permit increase in 2009. PM-10 is considered more deadly than ozone. 26-4-AM

Limerick discharges of Total Dissolved Solids (TDS) into the Schuylkill River are up to five times Safe Drinking Water Standards. TDS transports radiation and cooling tower toxics into this vital drinking water source for almost two million people from Pottstown to Philadelphia. Cooling towers are depleting the river, even after supplementation with toxic unfiltered mine water and other sources. 26-5-SW

FINCNCIAL INJUSTICE OF MAJOR PROPORTIONS!
We get the harms, Exelon gets the profits, and others including in other states get electric. Limerick's electric goes to the grid. It isn't produced just for people in our region. However, ratepayers in our region paid the lion's share of the $6.8 billion in costs for Limerick construction in their monthly electric bills from 1985 to 2010, and we still pay each month for Limerick decommissioning. Property taxes were avoided by PECO/Exelon from 1985 to 2002, when a court ordered Exelon to pay only $3 million each year, instead of the $17 million that should be paid each year. 26-6-OS

Mendiola, Doris

From: ROBERT MONGER <bojamon@yahoo.com>
Sent: Thursday, June 20, 2013 12:33 AM
To: Perkins, Leslie
Subject: Limerick Nuclear Plant Draft EIS

5/7/2013
78FR26663
5

Dear Ms. Perkins,

27-1-OR

After hearing all the facts in regards to the safety of the Limerick Nuclear Plant, there is no doubt that this power plant should be closed down. I was watching Frontline on TV and saw where Germany shut down sixteen of their Nuclear power plants.

27-2-OS
27-3-RW

We should not have to prepare for a nuclear disaster. If we would have a disaster, there is no way that the evacuation plan would work. They are polluting our air and water and we in Pottstown and surrounding areas are paying the price.

We are wondering why its so important for Limerick power plant to renew their license so soon. For all of our safety this power plant should be shut down,

27-4-LR
27-5-OR

Sincerely,

Janice Monger

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= L. Perkins (LPI)

1

Gallagher, Carol

From: Seiber, Benjamin <bseiber@pa.gov>
Sent: Tuesday, June 25, 2013 3:10 PM
To: Gallagher, Carol
Cc: Allard, David; Janati, Rich; Adams, Tammey; Yordy, Karyn
Subject: Limerick GEIS comments
Attachments: Limerick_PA_comments.pdf

Ms. Gallagher,

Please find attached comments from the Commonwealth of Pennsylvania regarding Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS) Limerick Generating Station, Units 1 and 2 (LGS) per docket number NRC-2011-0166-0049. The hard copy of the original letter is being mailed tomorrow. Thank you.

Ben Seiber | Program Analyst
Department of Environmental Protection
Rachel Carson State Office Building
400 Market Street | Harrisburg, PA 17101
Phone: 717.783.7702 | Fax: 717.783.8965

5/7/2013
78 FR 26663
7

1

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION
SECRETARY

June 25, 2013

Cindy Bladey, Chief
Rules, Announcements, and Directives Branch
Office of Administration, Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Docket ID No. NRC-2011-0166-0049

Re: Draft Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants, Supplement 49 Regarding Limerick Generating Station, Units 1 and 2

Dear Ms. Bladey:

The Pennsylvania Department of Environmental Protection (DEP) has completed its review of the draft plant-specific Supplemental 49 to NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants," regarding the license renewal of Limerick Generating Station (LGS), Units 1 and 2. This review pertains only to the radiological aspects of the LGS license renewal application.

DEP has no major concerns and does not object to the renewal of the LGS operating license for an additional 20 years. We do have a concern with the long-term storage of spent nuclear fuel at reactor sites. DEP encourages the NRC to continue with the timely development of an environmental impact statement to account for the long-term storage of spent nuclear fuel and high-level radioactive waste and associated transportation.

Radiological
DEP has no major concerns with the radiological portion of the draft GEIS for the Limerick license renewal. DEP has implemented a comprehensive nuclear safety and environmental surveillance program at the five reactor sites in Pennsylvania, including the LGS. Routine sampling of air, milk, surface water, vegetation and fish are performed, both independently and in conjunction with the facility's self-monitoring program. Environmental dosimeters record levels of radiation exposure in the vicinity of each nuclear power plant. The program also monitors the activities associated with the management and disposal of low-level radioactive waste (LLRW) in Pennsylvania.

Prior to Exelon's submittal of the license renewal application to the NRC, DEP requested that Exelon provide a description of the on-site groundwater monitoring program at LGS. The inclusion of this program in the license renewal application is not currently required by the NRC; however, Exelon responded favorably to DEP's request. The primary purpose of the groundwater monitoring program, as described in Section 5.2 of Exelon's submittal (Sections 2.2.5 and 4.5 of the draft GEIS), is to provide timely detection and response to any radiological releases to groundwater. Based on the information provided in this document and DEP's prior review of Exelon's Radiological Groundwater Protection Program, we believe that Exelon has taken appropriate actions to protect public health and safety and the environment, both during current and extended periods of LGS operations. DEP will continue to monitor

Rachel Carson State Office Building | P.O. Box 2063 | Harrisburg, PA 17105-2063
717.787.2814

www.depweb.state.pa.us

Exelon's activities in this area, an effort that includes regular interactions with the LGS Environmental Monitoring Program staff and analyzing samples of selected on-site monitoring wells, as deemed necessary.

Following Exelon's submittal of the license renewal application to the NRC, DEP staff attended the NRC public meeting for the acceptance of the license renewal application on September 22, 2011. DEP staff observed selected portions of the NRC audit of the LGS Aging Management Program during October 2011 and participated in the NRC environmental audit on November 7-10, 2011. On May 23, 2013, DEP staff attended the NRC public meeting to discuss the draft GEIS and to receive comments from public stakeholders regarding environmental aspects of the LGS license renewal application.

As it relates to management and disposal of LLRW, Exelon has received approval from the NRC for storage of LGS LLRW at the Peach Bottom Atomic Power Station (PBAPS) in Delta, PA. The NRC consulted with DEP prior to approval of Exelon's request. Considering the lack of an interim LLRW storage facility at the LGS, the small number of shipments, and the existing capacity of the interim LLRW storage facility at the PBAPS, DEP determined that the transfer of LLRW from LGS to PBAPS would not pose any danger to public health, safety or the environment. However, DEP stated that it expects Exelon to immediately cease shipments of LLRW from LGS to PBAPS when a disposal facility for Class B and C wastes becomes available. The new Waste Control Specialists facility in Texas is now fully operational and, as such, Exelon has confirmed that they will begin shipments of LGS LLRW to the Texas facility and halt future shipments of LLRW from LGS to PBAPS. 29-1-RW

Regarding the storage of spent nuclear fuel at the LGS site, DEP has publicly expressed concerns about long-term storage of spent nuclear fuel at the reactor sites. We encourage the NRC to continue with the timely development of an environmental impact statement, as part of its Waste Confidence decision and rule, to account for the long-term storage of spent nuclear fuel and high-level radioactive waste and associated transportation. The Commonwealth of Pennsylvania has been and continues to be a strong advocate for the Department of Energy's creation of a permanent repository for disposal of spent nuclear fuel and high-level radioactive waste. 29-2-RW

Thank you for the opportunity to provide comments on the LGS license renewal application. Should you have questions or need additional information, please contact Vincent J. Brisini, Deputy Secretary for Waste, Air, Radiation and Remediation, by e-mail at vbrisini@pa.gov or by telephone at 717.772.2724. You may also contact David Allard, Director of the Bureau of Radiation Protection, by e-mail at djallard@pa.gov or by telephone at 717.787.2480.

Sincerely,

E. Christopher Abruzzo
Acting Secretary

NRC ERRONEOUSLY STATES THAT LIMERICK'S ENVIRONMENTAL IMPACTS ARE SMALL

1. NRC relinquished control of NRC's regulatory process related to the a crucial valve critical to maintaining Limerick plant stability: 5-11-OS

Exelon is now in control of that crucial valve.

In 2011, during an accident at Limerick, NRC cited Limerick with noncompliance of a *legally binding* requirement involving the "failure of feedwater **Motor Operated Valve (MOV)** which resulted in loss of Core Isolation Coolant (RCIC) for longer than specifications allow according to Technical Specifications (TS)". The NRC cited the violation as a WEAKNESS IN MAINTAINING PLANT STABILITY.

In 2012, Exelon requested an amendment taking the MOV out of Technical Specifications (TS), under NRC regulatory control, and moving the MOV into the Technical Manual (TM),under Exelon's control and *not* regulated by NRC.

In 2013, the NRC inexplicably granted Exelon's request! *However, at TMI, on March 28, 1979, the immediate cause of the loss-of-coolant accident that allowed the uncovering of the core and the melting of about half of it was a* ***valve*** *that stuck open and allowed large volumes of water to escape.*

Is this one of those valves? We have grave concerns about it and would appreciate a comprehensive investigation of it.

2. NRC laxity regarding Limerick's aging GE Mark II Boiling Water Reactors (BWRs):

NRC Inspection Reports note serious degradation of Limerick's BWRs that could impact stability, like wear and tear at BWR vessel attachments, and yet NRC has inexplicably granted Exelon "Relief Requests" for such things as *weld inspections, counting relief as compliance for re-licensing.*

GE has repeatedly warned Limerick about BWR deficiencies, suggesting tests be performed to ensure safe shut down. Did NRC require Exelon to test? What was the outcome?

It is important to note that a nuclear accident in Germany at the AEG-Kraftwerks Union (KWU) Wurgassen Nuclear Plant was caused by a GE Mark II Boiling Water Reactor in 1974. This is relevant because that accident drew attention to the essential design flaw inherent to all GE Mark II Boiling Water Reactors. The KWU accident resulted from a rupture due to enormous unanticipated BWR vibrations, equal to the seismic vibrations of a major earthquake that built up during the quenching process (cooling process) causing the safety relief valve to fail to close. 5-12-OS

But PECO had made a financial investment in Limerick's BWRs by that time. SO, to save them, it experimented with an armature to lesson the vibrations. The Philadelphia Inquirer (1984) reported that: "Limerick's modifications included hundreds of additional pipe supports and elaborate bracing systems to make the reactor systems more rigid…similar to PP&L's Susquehanna Plant…You see pipe supports three times as big as the pipes themselves because of the changes."

Why has NRC granted Exelon relief requests for Limerick Vessel Attachment Weld Inspection and Evaluation Guidelines? In 1984, it was reported that hundreds of safety-related welds at the nuclear plant were not properly performed by the Bechtel Power Corp. welders and that the welds were not properly inspected by Bechtel and NRC inspectors (Mercury, 8/31/84).

On July 11, 2012, the NRC cited Exelon with a violation due to an accident by operator error involving BWR channels at Limerick. The inoperability of two independent channels was an issue: Limerick maintains that safety was maintained, however fatigue cracks were observed along the weld toe due to reverse bending and indicated the line was subject to vibration. Exelon was further cited for failing to respond to NRC in a timely fashion about the issue. We do not know if NRC's oversight in this area is as protective of the public as we would like it to be.

We are very concerned that the following NRC actions may further increase risks to the public:

- License Amendment to Modify Safety Limit Minimum Unit 1, Cycle 15 *GRANTED* Jan. 30/ 2012
- Core Operating Limits Report For Limerick Generating Station Unit 1, Cycle 15 *GRANTED* April 3, 2013
- "Withdrawal Notice" of *"Reporting procedure for mathematical models selected to predict heated effluent dispersion in natural water bodies."* (Regulatory Guide (RG) 4.4, NRC-posted in the Federal Register) *GRANTED* April 3, 2013
- Core Operating Limits Report For Limerick Generating Station Unit 2, Reload 12 *GRANTED* June 10, 2013
- Questions concerning these NRC/Exelon actions:
  - Was the intent of these actions to remove impediments to limiting heated discharges? If so, why? Theses actions have serious implications for adverse health risks.
  - If Exelon can't comply with standard limits on heated effluents, why doesn't NRC withhold granting the requests?
  - Do these actions totally remove the core limits? Do they compromise the integrity of the already degraded BWRs?
  - If the BWRs run hotter, won't they degrade faster?
  - Will NRC adjust its application approval by mandating an adjustment to Exelon's calculation for the accelerated aging effects that may impact the already degrading BWRs, due to higher heat?
  - We believe a new fuel mix(GNF2) is being used at Limerick. If so, does the new fuel mix produce more heat?
  - NRC/Exelon history shows a pattern of proceeding with action before (or despite) the possible adverse consequences.

- Is there any way to independently check Limerick's discharge temperatures without NRC or Exelon *interference*?

5-12-OS Cont'd

- **Another concern: everyday, 14.2 million gallons of very hot water leave the cooling towers loaded with dissolved solids and radiation.** This hot brew goes down pipe 001 to the diffuser and into the Schuylkill River. It enters the river at 110 F, a much higher temperature than the Schuylkill River limit of 87 F. When water is hotter than 95 F, it fosters the growth of thermophilic microbic organisms. These organisms include Legionella and Salmonella, among others. These pathogens thrive in warm water. They can also cause fatal infections and pneumonia in compromised individuals and the elderly. This hot water needs to be cooled down more than it can be at the present time.

5-13-HH

Exelon asked the Pa. DEP to provide comments about these pathogenic organisms in the river. Exelon wanted the Pa. DEP to confirm Exelon's conclusions that no harm would come from the pathogens during an extended period of operation with these higher temperatures.

The Pa. DEP, to its credit, said it had no data on these organisms in the river to support Exelon's claims. The Pa. DEP was unable to reach any conclusions as to the possible health effects, thus not supporting Exelon's contentions.

3. NRC's refusal to update Limerick's SAMA:

NRC has allowed many of its regulations to be systematically re-written by the NEI (Nuclear Energy Institute), the powerful lobbying arm of the nuclear industry. The NRC has allowed the NEI to thus create more regulatory protection for the industry, which significantly weakens safety for the public.

5-14-PA

An example is the difficulty encountered by the NRDC, when it attempted to require an updated SAMA for Limerick. The NRC would not consider it. NRC's stubborn position is reinforced by the legal armature designed to preserve Limerick for financial reasons, without consideration of whether there's a need for nuclear energy. NRC stated its SAMA position in the federal register (2007): "Staff Position: The NRC staff recommends that applicants for license renewal follow the guidance provided in Nuclear Energy Institute (NEI) 0501, Severe Accident Mitigation Alternatives (SAMA) Analysis Guidance Document, Revision A, when preparing their SAMA analysis."

In 2012, the NRC Commission refused the National Defense Resource Council's request (submitted in 2011) for an update of Limerick's SAMA on the grounds that the request was "an impermissible attack on our regulations".

4. NRC's refusal to update Limerick's earthquake analysis:

The Fukushima disaster began on March 11, 2011. Inexplicably, three months later, Exelon submitted its license renewal application for Limerick Nuclear Plant to the NRC.

NRC held a public meeting (9/22/11) to receive public comments on re-licensing Limerick. We were in the audience. A resident commented that she was <u>still</u> waiting for a response from the NRC about Limerick's closest faults, reminding the NRC that Limerick was ranked third on the U.S. Earthquake risk list.

5-15-PA

Through ACE, we saw a copy of the resident's response from NRC. The letter and the map focused on the Chalfont Fault (9 miles away) and the Ramapo Fault (17 miles away). The map was complex, but yellow and orange highlight indicated the faults and the fault network.

But we remembered hearing rumors that there was a fault *under* the plant, and the NRC's map was so hard to decipher that we decided to go to the Pottstown Library to see if there were any other maps there that would be easier to understand. Among the Limerick volumes lining a shelf in the archives, we found a decades-old Geologic Survey by Dames and Moore submitted to PECO in 1974.

Within its pages we found a large fold-out map in color that clearly showed the Sanatoga Fault running under the proposed Limerick Nuclear Plant site. It did not show the Chalfont or Ramapo Faults, but it did show the Linfield Dike not far from the plant, as well as the line marked Quarry Splay close to the site.

In March 2012, when the NRC held a less formal NRC public meeting, we took a copy of the 1974 Geologic Survey map that we had found in the Library to show to the NRC. The NRC Chief, Projects Branch 4, said he'd never seen it before and he referred us to the NRC official who was the author of the resident's response letter and map, who was also present. He had never seen the 1974 map before, either. It seemed that neither had ever even heard of the Sanatoga Fault. However, we were very surprised to hear the author of the letter off-handedly mention that the Ramapo Fault was active...

ACE had arranged a meeting with our local paper and we shared both maps and their respective stories with a reporter. It was weeks after the NRC meeting when the story finally broke, and it covered several pages. Both the Geologic Survey map and the resident's NRC-provided map were splashed across the front page. The paper was full of articles providing an excellent review of many renewed earthquake concerns, including fracking and quarry issues (an active blasting quarry shares its border with Limerick).

The newspaper reported that an NRC spokesperson's answer to the question of whether the NRC had considered the Sanatoga Fault when it licensed Limerick began with "The short answer is yes"....and went on. <u>Missing from the story was what is always missing: the central issue at stake: the evasiveness of the NRC. Whenever there's an issue of import, like an unusual event or accident at Limerick, the NRC dusts up the story to create the impression that everything is under control.</u>

5. Inaccurate prediction models, faulty assumptions: age-related degradation is already surpassing original models for predicting its speed:

No prediction model can protect the public from the dire consequences of Exelon's inaccurate hypotheses, calculations or poor judgment, which the NRC notes are pervasive at Limerick. And problems are growing, due to the age-related degradation resulting from 28 years of nuclear operations. Even so, with about a decade to go of Limerick's original licensed period, inexplicably, NRC is approving Exelon's license renewal request based on relaxed standards for Limerick:

- In 2012, NRC refused NRDC's request for an update of Limerick's SAMA, labeling the request "An impermissible attack on our regulations". 5-16-OS
- In 2012, NRC pared down emergency and evacuation planning, without re-evaluating earthquake risks
  - In 2013, ACE members discovered that NRC was either not aware of, or covered up, the existence of the Sanatoga Fault under the nuclear site (that met with a quarry splay that ran through the active blasting quarry that shares its border with the nuclear plant). NRC public statements have understated the risks.
  - In 2013, NRC threatened to refer ACE to its allegation team for expressing concerns about Exelon's unworkable Limerick Evacuation Time Estimate (which NRC requires for re-licensing, but refuses to review).This seems unwarranted, when NRC invites "meaningful" public participation.

6. The NRC has approved Exelon amendments that eliminate Limerick's compliance to NRC's re-licensing application requirements, meaning that problems are hidden, without being resolved. 5-17-OS

7. NRC has relinquished regulatory control to Exelon officials, who determine what regulations Exelon will comply with and which ones it will eliminate. 5-18-OS

8. NRC has repeatedly raised background radiation levels, which raise risks for the public here at Limerick:

The "background level" number that NRC assigns is a trigger point: nuclear plants must report levels above "background" on-site, as a spike indicates a serious problem. Our concern is that NRC's current number is so high that Exelon can claim Limerick's "routine operations and radiation releases" which may not reach the trigger point, comply with NRC regulations, but which, in reality, greatly increasing Limerick's adverse impact on public health, safety, and the environment. This is the history of NRC's assigned radiation level increases: 5-19-HH

- Pre-1964: natural background radiation: 60-80 Millerems per year
- Post-1964: NRC raised the level to 80-100 Millerems per year. A noted above, the significance of this is that it is a trigger point: when radiation readings at nuclear plants spiked above that NRC-set trigger point, notification of the NRC was required,
- Post-Chernobyl (1986): NRC raised the level to 360 Millirems per year
- Post-Fukushima (2011): NRC raised the level to 620 Millirems per year
- However, the 2005 National Academy of Science's BEIR VII Study, funded by the EPA, revealed that the smallest radiation dose could increase human health risks: there is no safe dose.

QUESTIONS:

1. Why is the NRC allowing Limerick to operate in violation of its license?

Over a decade of ACE research shows massive deficiencies, and at the top of this list of concerns is the fact that Limerick's GE Mark II Boiling Water Reactors are defective and NRC can't ensure public safety because Limerick's containment is not guaranteed. 5-20-OS

2. Why does NRC rely on Exelon, a company with a vested interest in the outcome, to *control* Limerick's data and to amend NRC's regulations of Limerick so that Exelon *appears* to conform to regulations without actually having to comply? 5-21-OS

Exelon explains Limerick's current licensed period: "The 40-year license term reflects the amortization period generally used by electric utility companies for large capital investments". Exelon's use of nuclear power is a purely financial decision. So, public safety is dependent on NRC regulation. Inexplicably, NRC states that Exelon controls the data that NRC receives and relies on to assess the safety of Limerick. We believe this process is upside-down and poses a significant threat to public health, safety, and the environment.

3. Why isn't NRC using Limerick's abysmal safety record as the strongest evidence that NRC should not rush approval of Limerick's license renewal?

ACE research, some of which was sent to your office in its request for a Senate investigation, documents extraordinary safety issues that NRC fails to address. More is included with this letter. 5-22-OS

4. How can the Atomic Energy Act of 1954 be a relevant basis for the license renewal of Limerick in 2013? 5-23-OS

The naivety of the 50's and the myth of nuclear safety must give way to the newly understood impacts of nuclear generation in the 21st century. Re-licensing Limerick without requiring Exelon to comply with the conditions of

an ordinary NRC License Renewal Application should be viewed as a significant warning sign that Limerick operations must be very unsafe. 5-23-OS Cont'd

5. Why does NRC's "License Renewal Requirements for Power Reactors" sound less like "requirements" and more like a "disclaimer"? 5-24-OS

On page '1- 3' of Limerick's Safety Evaluation Report, 2012, released Jan. 10, 2013, NRC states that "License renewal requirements for power reactors are based on two key principles:

1. The regulatory process is adequate to ensure that the licensing basis of all currently operating plants maintain an acceptable level of safety with the possible exceptions of the detrimental aging effects on certain functions of certain structures, systems or components, as well as a few other safety-related issues, during the period of extended operation.

2. The plant-specific licensing basis must be maintained during the renewal term in the same manner and to the same extent as during the original licensing term."Would a person buy a used washing machine with a warranty like that? Limerick is a nuclear plant: it should be held to the highest standards, yet NRC has never required Limerick nuclear plant to be in compliance. Why?

6. How can NRC have any excuse for re-licensing Limerick when Limerick's present condition is so degraded that even *current* operations pose an incalculable risk public health, safety, and the environment? 5-25-OS

7. Why do the four items, that the 1984 NRC section chief said that his staff wanted cleared up before licensing Limerick, still exist at Limerick? (Mercury, 8/31/84) 5-26-OS

- Improper procedures: pervasive and repeatedly cited by NRC.
- Incomplete safety measures: pervasive and repeatedly cited by NRC.
- A defective hydrogen remover: at least one accident in the re-licensing period involved a hydrogen leak: is there a way to confirm that the defective hydrogen remover was repaired or replaced?
- **Faulty valves:** In 2011, about six months after Exelon applied for Limerick's license renewal, the NRC cited Limerick with a "white" violation, defined as a **"WEAKNESS IN MAINTAINING LONG-TERM PLANT STABILITY".** Unlike Limericks' usual violations of noncompliance to regulations, *this* violation was a "***Violation of a Legally Binding Requirement".*** The violation involved the failure of the Motor Operated Valve **(MOV)**, mentioned on the first page of this letter.

8. To what degree is NRC allowing Modifications to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events? (Issuance of Order: 3/13/12) 5-27-PA

9. Is the NRC conducting a substantive "waste confidence study" that protects the public or, as we fear, relying on its phone conference with Exelon? 5-28-RW

We hope it is not taking Exelon's word for how it is coping with the substandard containment, or protecting the above-ground storage from a terrorist attack, or providing for backup power in case of extended power outages to cool the fuel pools.

NRC officials told us at a meeting in 2013, that they rely on Exelon to take care of that and they couldn't tell us anything about waste-storage issues.

10. What is the reason that Exelon, a declining private corporation, which some say is on the wrong side of energy progress, can operate Limerick, thus eliminating the public's right to clean air, water, and the environment for posterity, as guaranteed in Pennsylvania's constitution when its method? 5-29-OS

~~See ACE research on how Limerick's nuclear energy can be replaced by readily available, safer, cheaper~~ energy technologies .

11. How can NRC justify the risks to the public caused by Limerick's pervasive safety violations, when demand for nuclear energy is down, alternative energy is available, and so many local businesses have chosen solar over nuclear? 5-30-AL

See ACE data on the many local corporations and organizations that have chosen solar over nuclear energy.

12. Why has NRC excused Limerick from complying Compliance with GALL regulations in Limerick's License Renewal Application?

In 1998, the NRC allowed the NEI to amend the GALL Report to make the process of nuclear plant license renewal easier and faster. The Nuclear Energy Institute (NEI) is the powerful lobbying arm of the nuclear industry.

GALL Commitment No. 46 requires applicants for license renewal to test and confirm that their programs for aging equipment and systems work as a condition for re-licensing.

However, Exelon requested the elimination of GALL Commitment No. 46 by amendment that would substitute a one-time test at Limerick in the future. NRC pointed out that eliminating the test would create a 10-year gap during which there would be no way to tell if planned "aging management programs are effective, require modification, or whether there is a need to develop new aging management programs". Exelon's application also contained: 5-31-OS

- *Deviations from GALL (Generic Aging Lessons Learned)*

June 27, 2013

Via Electronic Mail

Ms. Cindy Bladey
Chief, Rules, Announcements, and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Comments on NRC's Supplement 49 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, regarding renewal of operating licenses for Limerick Generating Station, Docket ID NRC-2011-0166.

Dear Ms. Bladey:

The Natural Resources Defense Council (NRDC) writes today to comment on the Nuclear Regulatory Commission's (NRC) draft plant-specific supplement 49 to the Generic Environmental Impact Statement for License Renewal of Nuclear Plants (GEIS), NUREG-1437, regarding the renewal of operating licenses NPF-39 and NPF-85 for an additional 20 years of operation for Limerick Generating Station (the "draft GEIS Supplement"). *See* 78 Fed. Reg. 26663 (May 7, 2013). NRDC respectfully urges NRC to withdraw the draft GEIS Supplement as the agency's actions fail to meet the requirements of the National Environmental Policy Act (NEPA) 42 U.S.C. § 4321, *et seq.*, as described in detail below.

NRDC Comments on GEIS Supplement Section 1: "PURPOSE AND NEED FOR ACTION"

"The NRC makes the decision to grant or deny license renewal based on whether the applicant has demonstrated that the environmental and safety requirements in the agency's regulations can be met during the period of extended operation." (page 1-1, lines 12-14) 30-1-LR

NRDC COMMENT: The existing licenses for Units 1 and 2 of the Limerick Generating Station (LGS) expire on October 26, 2024, and June 22, 2029, respectively. The current licenses for LGS do not expire for another 11 (Unit 1) and 16 years (Unit 2). Renewing these licenses for another 20 years would result in the licenses expiring in 2044 (Unit 1) and 2049 (Unit 2). *Has the NRC defined when, in the course of an applicant's current license, that applicant can or should apply for a license extension?* If an applicant applies for a license extension early, as in this case more

than a decade before expiration of current licenses, then the NEPA analysis which supports the federal action has to be projected further out into the future and is therefore less certain and can be relied on with less confidence in the government's decision. For example, as noted below, Section 3 of the GEIS Supplement concerns the environmental impacts of refurbishment, including major refurbishment activities in a boiling water reactor (BWR) such as replacement of recirculation piping and pressurized water reactor steam generators. The GEIS Supplement for LGS did not include an evaluation of the environmental impacts of nuclear power plant refurbishment because "Exelon did not identify the need to undertake any major refurbishment or replacement actions" (page 3-2, lines 10-11). However after a further decade of operation the need to undertake major refurbishment could arise. In another example, Section 4 of the GEIS Supplement for LGS discusses the fluctuations in measurements of tritium in groundwater at monitoring wells since 2006 (page 4-6, lines 27-33). As the LGS units age over another decade, tritium levels in groundwater could fluctuate further, necessitating additional environmental review under NEPA.

30-1-LR Cont'd

NRDC recommends that, in order to reduce uncertainty, the federal government defer a final decision on license extension for LGS until a time period closer to the expiration of current licenses for these two reactors, for example within two years of expiration of current licenses. Reinforcing this position, the GEIS Supplement asserts that: "The NRC has established a license renewal process that can be completed in a reasonable period of time with clear requirements to ensure safe plant operation for up to an additional 20 years of plant life" (page 1-3, lines 20-22). If the license renewal process can be completed in a reasonable time, then renewing licenses for LGS so far in advance is unwarranted, and forces NRC's analysis in support of the NEPA process to be significantly weakened, as the NRC must thereby predict events farther in the future in support of government decision making.

NRDC Comments on GEIS Supplement Section 3: "ENVIRONMENTAL IMPACTS OF REFURBISHMENT"

NRDC COMMENT: GEIS Supplement Section 3 "ENVIRONMENTAL IMPACTS OF REFURBISHMENT" does not, in fact, analyze the environmental impacts of refurbishment because: "Exelon did not identify the need to undertake any major refurbishment or replacement actions associated with license renewal to support the continued operation of LGS beyond the end of the existing operating license" (page 3-2, lines 10-12). NRDC requests that the NRC itself determine if Exelon's statement is reasonable in a final GEIS Supplement. A steam generator replacement will likely be needed to support operation in the extended license period, probably in conjunction with the planned, but now deferred, power uprate for Limerick. The GEIS Supplement is deficient in this regard, as major refurbishment activities have occurred

30-2-RF

at numerous reactors in the course of their operating life, and may or may not occur at LGS in the future. Given the length of time to the end of extended licenses for LGS Unit 1 and Unit 2, 31 and 36 years, respectively, how much certainty can the NRC have that major refurbishment will not be required after decades of continued operation? Given the uncertainty in projecting aging effects so far forward in time, a conservative and robust approach to NEPA requirements in support of the government's decision should include an analysis of the environmental impacts of refurbishment at LGS. 30-2-RF Cont'd

NRDC Comments on GEIS Supplement Section 5: "ENVIRONMENTAL IMPACTS OF POSTULATED ACCIDENTS"

NRDC COMMENT: (Section 5.3, pages 5-3 to 5-14) The NRC begins this section by recounting the reasons the Commission concluded in 1999 that future updating of the 1989 Severe Accident Mitigation Design Alternatives (SAMDA) analysis would be unnecessary—the basis for 10 CFR 51.53(c)(3)(ii)(L). To the contrary, as shown here, subsequent events have proven that the Commission's earlier thinking was flawed. We begin by quoting from the GEIS Supplement: "The staff has previously performed a site-specific analysis of severe accident mitigation in a NEPA document for LGS in the Final Environmental Statement Related to Operation of LGS, Units 1 and 2 in NUREG-0974, Supplement 1 (NRC 1989) ("1989 SAMDA Analysis")." (page 5-3, lines 13-15). The staff concluded that: "The risks of early fatality from potential accidents at the site are small in comparison with risks of early fatality from other human activities in a comparably sized population, and the accident risk will not add significantly to population exposure and cancer risks. Accident risks from Limerick are expected to be a small fraction of the risks the general public incurs from other sources. Further, *the best estimates show that the risks of potential reactor accidents at Limerick are within the range of such risks from other nuclear power plants* (emphasis added)." (page 5-3, lines 25-31). The last sentence in the quote above is false, in that the theoretical "best estimate" calculation of core damage frequency is orders of magnitude lower than the historical risk, when world data are used, as described below. 30-3-PA

The staff goes on to say: "However, in the LGS specific 1989 SAMDA Analysis, the staff acknowledged: In the longer term, these same severe accident issues are currently being pursued by the NRC in a systematic way for all utilities through the Severe Accident Program described in SECY-88-147, "Integration Plan for Closure of Severe Accident Issues" (NRC 1988c). The plan includes provisions for an Individual Plant Examination (IPE) for each operating reactor, a Containment Performance Improvement (CPI) program, and an Accident Management (AM) program. These programs will produce a more complete picture of the risks of operating plants and the benefits of potential design improvements, including SAMDAs. *The staff believes that the severe accident program is the proper vehicle for further review of severe*

accidents at nuclear power plants, including Limerick." (page 5-3, lines 32-43, emphasis supplied). Of course subsequent to the Fukushima Dai-ichi accident, the last sentence in the quote above turned out to be incorrect, in that the Staff and Commission have decided to address most of the Fukushima issues in separate venues.

The staff then go on to observe: "In light of these studies, the Commission believed [in 1996] it was "unlikely that any site-specific consideration of SAMAs for license renewal will identify major plant design changes or modifications that will prove to be cost-beneficial for reducing severe accident frequency or consequences" (61 FR 28467)." (page 5-4, lines 5-8). Again, the Commission programs for addressing a wide range of safety issues requiring potential plant design changes as a follow up to the accident at Fukushima Dai-ichi have proven that the Commission's earlier conclusion was short sighted and in error.

30-3-PA Cont;d

Beginning on page 5-7, the Staff correctly observes: "Additionally, both the applicant and the NRC must consider whether new and significant information affects environmental determinations in the NRC's regulations, including the determination in 10 CFR 51.53(c)(3)(ii)(L) and Table B-1 that the agency need not reconsider SAMAs at license renewal if it has already done so in a NEPA document for the plant." (page 5-7, lines 10-13). The Staff then sets a high bar: "New information is significant if it provides a seriously different picture of the impacts of the Federal action under consideration. Thus, for mitigation alternatives such as SAMAs, new information is significant if it indicates that a mitigation alternative would substantially reduce an impact of the Federal action on the environment. Consequently, with respect to SAMAs, new information may be significant if it indicated a given cost-beneficial SAMA *would substantially reduce the impacts of a severe accident, the probability or consequences (risk) of a severe accident occurring."* (page 5-7, lines 13-15, emphasis added).

Having set the bar high, the Staff proceeds to analyze four issues, and does so individually, rather than collectively. The Staff ignores an issue we raised in NRDC's intervention in the Limerick license renewal proceeding. The Declaration of Thomas B. Cochran, Ph.D., Matthew G McKinzie, Ph.D., And Christopher J. Weaver, Ph.D. on behalf of the Natural Resources Defense Council, In the Matter of Exelon Generating Company, LLC, (Limerick Generating Station License Renewal Application) Dockets No. 50-352-LR and 50-353-LR), November 22, 2011, namely, that the risk of a core damage accident at Limerick is likely to be much greater than the theoretical estimate based on the Limerick Probabilistic Risk Assessment (PRA). In the Cochran, McKinzie, Weaver declaration we stated: "The Limerick SAMDA analysis relies on a Core Damage Frequency (CDF) of 4.2 x 10^{-5} per year (NRC, 1989) and the Environmental Report submitted by the applicant cites an estimate of CDF, which only includes internal events, for Limerick Units 1 and 2 of 3.2 x 10^{-6} per year based on a Probabilistic Risk Assessment (PRA) (Exelon, 2011b). In a recent update to the licensee's IPEEE model to include internal fire risks as well as internal

events in its PRA, the license calculated a total CDF of 1.8×10^{-5} per year for these hazard groups (NRC, 2011b). Because the PRA is based on modeling assumptions that contain a large number of approximations, large uncertainties, and omissions, the absolute value of a CDF calculated using PRA is not a reliable predictor of the actual CDF value."

Worldwide, NRDC calculates that there have been approximately 429 light water reactors (LWR) that have operated approximately 11,500 reactor-years, and that five of these LWRs (Three Mile Island Unit 2, Greifswald Unit 5, Fukushima Daiichi Units 1, 2, and 3) have experienced core damage as CDF is defined in NUREG-1150 Vol. 1, pg 2-3. Thus, for this class of nuclear power reactors, LWRs, the CDF is approximately 4.3×10^{-4} per reactor-year based on the historical record. I calculate that in the United States there have been approximately 116 LWRs that have operated approximately 4,100 reactor years. One of these LWRs (Three Mile Island Unit 2) experienced core damage as defined by NUREG-1150. Thus, for this class of nuclear power reactors the CDF is approximately 2.4×10^{-4} per reactor-year based on the historical record. The Limerick reactors, BWRs with Mark 2 containments, are similar in many respects to Fukushima Daiichi Units 1, 2 and 3, BWRs with Mark 1 containments. While no U.S. BWRs have experienced core damage as defined by NUREG-1150, I calculate that worldwide there have been approximately 117 BWRs that have operated approximately 3,300 reactor-years. Three of these BWRs (Fukushima Daiichi Units 1, 2, and 3) have experienced core damage as defined by NUREG-1150. Thus, for this class of nuclear power reactors worldwide the CDF is approximately 9×10^{-4} per reactor-year based on the historical record.

30-3-PA Cont'd

In sum, the global CDFs for all LWRs and the subset of BWRs based on historical data are much greater than the theoretical value calculated by the applicant for Limerick Units 1 and 2, as is the U.S. historical CDF for LWRs. If a larger CDF is assumed in a PRA, then the calculated cost of severe accidents within a SAMA analysis would be increased proportionally, and thus it would be more likely that the economic viability of the measures to mitigate such accidents would be cost-beneficial.

We do not argue that any of the above CDF estimates based on the historical evidence represent the most accurate CDFs for Limerick Units 1 and 2. In our judgment the most accurate values of CDF probably lie somewhere between the theoretical values calculated by the applicant and one or more of the U.S. or global values based on the historical record. However, the CDFs used in a Limerick SAMA analysis should be evidence based. The applicant's estimates of CDF are non-conservative and a Limerick SAMA analysis would benefit from a sensitivity analysis in which higher core damage frequencies are assumed. Given the historical operating record of similar reactors, we assert that it is simply not credible to assume the CDF for older BWR reactors in the United States, such as Limerick Units 1 and 2, to be as low as 1.8×10^{-5} per reactor year, i.e., about one core damage event per 55,000 reactor-years of operation.

A range of CDF values including values close to those estimated from the global historical evidence should be used in the SAMA analyses for Limerick Units 1 and 2. This issue should be analyzed and discussed in the Limerick environmental report and the final environmental impact statement.

30-3-PA

In our view a current-day SAMA analysis is required in the NEPA analysis of severe accidents—one that includes the cumulative impacts of a severe accident based on new and significant information, including a range of core damage frequencies between the very low frequency estimated by the theoretical PRA process and the high frequency estimated using historical world data.

NRDC COMMENT: On page 5-4 of the GEIS Supplement, the NRC discusses the Containment Performance Improvement (CPI) Program and the Individual Plant Examination (IPE), and in this discussion the GEIS Supplement repeatedly states that the NRC relies on these programs in determining that Severe Accident Mitigation Alternatives (SAMAs) need not be performed at license renewal if the staff had already performed a SAMA review in an earlier NEPA document. The phrasing clearly implies that any new and significant information that may be discovered in the intervening years between initial licensing and the license renewal stage will have been adequately considered and should satisfy all requirements pursuant to NEPA, namely a thorough analysis of environmental impacts. However, the CPI, IPE, Individual Plant Examination of External Events (IPEEE), or any other accident management programs or processes, cannot substitute for NEPA review under the legal precedent *United States v. Coalition for Buzzards Bay,* 644 F.3d 26, 38 (1st Cir. 2011), which rejected arguments that alternative process can substitute for NEPA. In addition, the case *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 729 (3rd Cir. 1989)) established that Atomic Energy Act procedures cannot substitute for compliance with NEPA.

30-4-PA

NRDC Comments on GEIS Supplement Section 6: "ENVIRONMENTAL IMPACTS OF THE URANIUM FUEL CYCLE, SOLID WASTE MANAGEMENT, AND GREENHOUSE GAS EMISSIONS"

NRDC COMMENT: In the GEIS Supplement Section 6, the NRC states: "There are no Category 2 issues related to the fuel cycle and waste management." (page 6-1, line 19). The implications of this determination for the fuel cycle and solid waste management are that storage, transportation and offsite radiological risk associated with spent nuclear fuel are independent of the proximity and size of populations in the region of LGS spent nuclear fuel storage, or the sizes of populations along roads or rail lines if spent nuclear fuel is transported offsite from LGS In Section 5 of the GEIS Supplement, Exelon estimates that the population within 50 miles of LGS is projected to increase to 9,499,925 in the year 2030. (page 5-9, lines 7-8). This population

30-5-RW

estimate, which includes portions of the Philadelphia metropolitan area, shows that LGS is an outlier among US nuclear power plants in terms of having large nearby populations. Therefore fuel cycle and solid waste management issues cannot be analyzed generically for LGS. The draft GEIS Supplement should re-analyze fuel cycle and solid waste management on a site-specific basis with respect to evaluating the risks and consequences of extending the operating licenses for LGS.

30-5-RW Cont'd

NRDC COMMENT: Despite the fact that the NRC has determined that fuel cycle and solid waste management are category 1 issues, the NRC did examine site-specific impacts in the GEIS Supplement with respect to the potential for new and significant information: "the staff did not find any new and significant information related to the remaining uranium fuel cycle and solid waste management issues listed in Table 6–1 during its review of the Limerick Generating Station environmental report (ER) (Exelon 2011), the site visit, and the scoping process. Therefore, there are no impacts related to these issues beyond those discussed in the GEIS. For these Category 1 issues, the GEIS concludes that the impacts are SMALL, except for the issue, "Offsite radiological impacts (collective effects)," which the NRC concluded are acceptable." (page 6-2, lines 8-14) As discussed in the GEIS Supplement Section 1, "The NRC's standard of significance for impacts was established using the Council on Environmental Quality (CEQ) terminology for "significant." The NRC established three levels of significance for potential impacts: SMALL, MODERATE, and LARGE." (page 1-4, lines 6-8). NRDC notes that the impacts for the fuel cycle issue "Offsite radiological impacts (collective effects)" has not been evaluated using the three levels of significance which the NRC has established. NRDC comments that the NRC should clarify the impacts of "Offsite radiological impacts (collective effects)" in terms of SMALL, MODERATE or LARGE impacts, and describe the basis for this categorization of the risk.

30-6-RW

NRDC COMMENT: Regarding the June 2012 U.S. Court of Appeals for the District of Columbia Circuit's decision to vacate the NRC's Waste Confidence Decision (WCD) Update (*State of New York, et al. v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)) that has forced the NRC to develop an Environmental Impact Statement (EIS), in Section 6 of the GEIS Supplement NRC states that: "If the results of the WCD EIS identify information that requires a supplement to this EIS, the NRC staff will perform any appropriate additional NEPA review for those issues before the NRC makes a final licensing decision." NRDC comments that the potential environmental impacts defined by a future WCD EIS could plausibly be LARGE and be a deciding factor in the federal government's decision as to whether or not to extend the operating licenses of the two reactors at LGS. Exelon's ER and the draft GEIS supplement does not now include an analysis of the environmental impacts caused by the storage of nuclear waste at Limerick following the end of the requested operating license nor does it contain an analysis of the environmental effects of failing to establish a repository (and thus the necessity of a site specific review of indefinite storage of spent fuel). The absence of such an analysis violates NEPA and related

30-7-RW

regulations. Because neither the ER nor the GEIS (NUREG-1437), nor the NRC in any other context has examined these impacts, and because, as reiterated in the GEIS supplement, the United States Court of Appeals for the District of Columbia Circuit vacated the findings and regulations that NRC relied on to bar consideration of such impacts in license renewal, such analysis is now required to satisfy the requirements of NEPA for license extension at LGS. Furthermore, since these nuclear waste impacts are an intrinsic part of the NEPA analysis required to support a Commission decision on license renewal, and this analysis is missing from the draft circulated for public comment that we are commenting on today, this draft GEIS Supplement should be reissued and recirculated for public comment when this missing analysis becomes available.

30-7-RW Cont'd

NRDC Comments on GEIS Supplement Section 8: "ENVIRONMENTAL IMPACTS OF ALTERNATIVES"

NRDC COMMENT: Section 8 of the GEIS Supplement retains many of the factual, legal, and analytical errors in the Applicant's ER previously identified by NRDC. *See* Natural Resources Defense Council Combined Reply To Exelon And NRC Staff Answers To Petition To Intervene In the Matter of EXELON GENERATION COMPANY, LLC (Docket No. 50-352-LR, Docket No. 50-353-LR (Limerick Generating Station, Units 1 and 2)) January 6, 2012 (License Renewal Application), p. 46 -78. Furthermore the GEIS Supplement for LGS fails to conform to the basic guidelines for consideration of the No Action Alternative outlined in the GEIS (NUREG-1437, 1996). The Commission makes a distinction, as do all Federal agencies subject to NEPA, between the analysis of reasonable alternatives that satisfy the purpose and need for a proposed action – in this case meeting the future base load generating requirement currently being met by LGS via license extension or a reasonable alternative – and the alternative of no action, which by definition would not satisfy the purpose and need for nuclear or equivalent "base load" capacity, but might offer other advantages, such as the preservation of important environmental equities and/or the avoidance of significant environmental risks – such as a severe accident at LGS affecting the health, property, and livelihoods of millions of people within a 50 mile radius of the plant -- which could be uncovered through a NEPA analysis.

30-8-AL

> The Nuclear Regulatory Commission's (NRC's) environmental review regulations implementing the National Environmental Policy Act (NEPA) (10 CFR Part 51) require that the NRC consider all reasonable alternatives to a proposed action before acting on a proposal, including consideration of the no-action alternative. The intent of such a consideration is to enable the agency to consider the relative environmental consequences of an action given the environmental consequences of other activities that also meet the purpose of the action, *as well*

> *as the environmental consequences of taking no action at all*. GEIS at 8-1 (emphasis added).

Thus, as is clear from the preceding quotation, the Commission regards the "No Action Alternative" as distinct from, and therefore not interchangeable with, consideration of the "Proposed Action" and "reasonable alternatives" that "also meet the purpose of the action."

Almost by definition, then, analysis of the "No Action Alternative" cannot be equated with satisfying the purpose and need for the proposed action, and therefore the required NEPA consideration of "No Action" cannot reasonably be equated with "replacing the generating capacity of LGS," or limited to an analysis of this particular problem. Instead, as we stated previously in our Contention 4E concerning the ER, absent LGS license extension, the likely evolution of electricity system resources [in the PJM Interconnection] is an empirical and analytical question...that necessarily involves making an informed projection of the likely portfolio of PJM electricity system resources available in the region served by LGS beginning 13 years and 18 years hence that could reasonably be expected to supply the *energy services* currently supplied by LGS." As we have stated previously, the "reasonably foreseeable system resources" available under no action include, *in addition to* those reviewed by Exelon as reasonable alternatives to extended operation of LGS, all forms of Demand Side Management (DSM), waste heat co-generation, combined heat and power, and distributed renewable energy resources (including rooftop and parking-lot PV solar, wind, small hydro,and gasified biomass feeding small combustion turbines and fuel cells). The draft GEIS Supplement analysis of the No Action Alternative fails to consider the environmental impacts of this reasonably foreseeable *portfolio* of PJM system resources, and thereby fails to make the required comparison between the environmental impacts of No Action and the continued operation of LGS for an additional 20 years. Although now dated, the 1996 GEIS clearly suggests and sanctions this approach to analysis of the No Action Alternative. Section 8.1 of the GEIS includes a brief, but highly instructive discussion of "conservation and power import alternatives:"

30-8-AL Cont'd

> Although these alternatives do not represent discrete power generation sources they represent options that states and utilities may use to reduce their need for power generation capability. *In addition, energy conservation and power imports are possible consequences of the no-action alternative*. GEIS at 8-2 (emphasis added).

The GEIS outlines the necessary scope of environmental analysis for the no-action alternative as follows:

> [T]he no-action alternative is denial of a renewed license. Denial of a renewed license as a power generating capability may lead to a variety of potential

> outcomes. In *some* cases denial may lead to the selection of other electric generating sources to meet energy demands as determined by appropriate state and utility officials. In *other* cases, denial may lead to *conservation measures* and/or *decisions to import power*. In addition, denial may result in a *combination* of these different outcomes. Therefore, *the environmental impacts of such resulting alternatives would be included as the environmental impacts of the no-action alternative*. GEIS at 8-2 (emphasis added).

30-8-AL Cont'd

The draft GEIS Supplement fails to take this integrated portfolio approach to its analysis of the No Action Alternative, and to a considerable extent, this deficiency also affects its analysis of reasonable alternatives for LGS replacement. In particular, it fails to project how the *current level of energy services* supported by LGS "baseload capacity" within PJM could be supplied 10 and 15 years hence by a balanced portfolio of end-use energy efficiency improvements, avoidance/reduction of transmission losses, utility-scale wind power (both land and offshore), residential solar, institutional/industrial/commercial rooftop solar, parking-lot solar, small hydro, small wind, distributed geothermal, industrial waste-heat cogeneration, residential and commercial combined heat and power systems, landfill and agriculture biogas generation using fuel cells and/or small combustion turbines, emerging wave/tidal/ocean thermal technologies, utility scale NGCC, and if needed, power imports from outside PJM. *Such balanced portfolios for replacing existing traditional large-scale baseload generating assets are objectively reasonable and are indeed the target of current explicit state and federal policies*.

NRDC COMMENT: (page 8-2, line 7) "The NRC ultimately makes no decision about which alternative (or the proposed action) to carry out because that decision falls to utility, state, or other Federal officials. Comparing the environmental effects of these alternatives, however will help NRC decide whether the adverse environmental impacts of license renewal are so great as to deny the option of license renewal for energy-planning decisionmakers (10 CFR 51.95(c)(4)."

The referenced regulation states, in pertinent part: "The Commission shall determine whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable." By failing to compare the environmental consequences of license renewal for the obsolescent LGS reactors–including the consequences of a low probability but severe LGS accident and the full life cycle consequences of LGS fuel production, storage, and disposal–with a reasonably projectable range of balanced electricity portfolios (comprised of energy efficiency and numerous distributed low-carbon energy resources) as outlined above, the draft GEIS Supplement fails to supply the information necessary to a fully informed, NEPA-compliant comparison of the environmental risks and consequences of the Proposed Action with the

30-9-AL

alternative of No Action, while also arbitrarily excluding such balanced low-carbon portfolios from its analysis of "reasonable" alternatives for LGS capacity replacement. 30-9-AL Cont'd

NRDC COMMENT: (page 8-2, line 25) "In evaluating alternatives to license renewal, the NRC considered energy technologies or options currently in commercial operation, as well as some technologies not currently in commercial operation but likely to be commercially available by the time the current LGS operating licenses expire." The GEIS Supplement does not appear to take into account technology change at all in its analysis, and in fact appears to rely on sources for the cost and performance of alternative generating technologies that are dated (e.g. 2008, rather than 2012-13 when the GEIS Supplement analysis was prepared) suggesting that the Staff has continued to lean heavily on the flawed and dated analysis in the Applicant's ER. For example, the discussion of solar technology alternatives for replacing LGS Units 1 and 2 in *2024 and 2029*, respectively, is based on the technically dated 1996 GEIS, a ten-year-old analysis by utility-dominated Electric Power Research Institute (EPRI) conducted in 2003, the Applicant's own hugely deficient ER, which examines central station solar deployment alternatives that are absurdly unsuited to the geographic area served by PJM, and a *draft* 2010 BLM-DOE PEIS for "Solar Energy Development in *Six Southwestern States*" (emphasis added), while failing to cite a single document describing the extensive *distributed* solar development occurring right next door to LGS in the states of New Jersey and New York. The current and projected technical characteristics, capacities, and costs of various plausible solar and alternative low-carbon technologies, and combinations of such technologies are nowhere described, so there is no empirical basis for ascertaining whether the few arbitrarily selected and misconceived "alternatives" compare favorably or unfavorably with LGS license extension or the other large central stations alternatives (Pulverized coal, IGCC gas, new nuclear, and onshore wind) arbitrarily deemed "reasonable" and therefore subjected to "detailed" analysis. Nor does the draft GEIS Supplement make any attempt to project the performance and cost of solar and other renewable energy technologies that could plausibly be available beginning 10-15 years hence as "reasonable" alternatives to LGS license extension, and potentially impose fewer environmental harms and risks than LGS and its supporting fuel cycle. Nor does the draft GEIS Supplement project the performance and cost of energy storage technologies and related low-carbon technologies, such as fuel cells, that can "smooth" the output and extend the availability of "intermittent" renewable energy and thereby make it a round-the-clock dependable source of power on the grid. These vast gaps in the draft GEIS Supplement analysis are impossible to ignore. 30-10-AL

NRDC COMMENT: (page 8-2, line 39) "Alternatives that cannot meet future system needs by providing amounts of baseload power equivalent to LGS's current generating capacity, and in some cases, those alternatives whose costs and benefits do not justify inclusion in the range of reasonable alternatives, were eliminated from detailed study." This statement abundantly 30-11-AL

illustrates why this analysis does not begin to fulfill the requirements of NEPA: (a) Please explain why, if NRC believes it is precluded from making a "decision about which alternative [including the proposed action] to carry out," it is nonetheless knows enough to both implicitly specify "future system needs" and then exclude alternatives that "cannot meet those needs by providing amounts of baseload power equivalent to LGS's current generating capacity?" (b) We note that the GEIS Supplement contains no projections of "future system needs," nor does it contain any evidence whatsoever that various plausible combinations of DSM, reduced-carbon distributed generation, and renewable energy resources would prove incapable of meeting future customer demand for energy services now met by LGS, thus requiring future dependence on LGS license extension or a similar large "baseload" facility.

30-11-AL Cont'd

Indeed, the analytical requirement that any "reasonable alternative" to LGS license renewal – with the exception of an exceptionally vague, barely considered "purchased power alternative" that is nonetheless deemed "reasonable" – must be comprised of a singular generating technology of equivalent effective generating capacity to LGS, is an unrealistic, unnecessary, arbitrary and capricious assumption. This is particularly true given that electric power from LGS license renewal or alternative would be sold into a competitive wholesale power market *10 -15 years hence* – allowing plenty of time for the Independent System Operator/Regional Transmission Organization (ISO/RTO) via competitive reverse auctions to "clear" the future capacity market represented by LGS's possible demise – and that DSM measures and all forms of utility-scale and distributed generation are free to compete in this marketplace to meet future demand.

NRDC COMMENT: (page 8-3, line 14) "A three-level standard of significance—SMALL, MODERATE, or LARGE—is used to indicate the intensity of environmental effects for each alternative undergoing in-depth evaluation." This vague taxonomy of relative impacts conveys almost no meaningful information regarding the specific nature and ecological harms of the impacts thus described, but only that some are (supposedly) relatively larger or smaller than others, but often not even that much information is conveyed, as when a "qualitative" range is employed (e.g. "SMALL to LARGE") to characterize an impact area, and compared to the same environmental facet of alternatives likewise expressed as a range ("SMALL to MODERATE" or "SMALL to LARGE".) Thus, for example when the "Land Use" impact is given as SMALL for "License Renewal," but "SMALL to MODERATE" for "New Nuclear at an Alternate Site," and "SMALL to LARGE" for Solar PV, no useful information is conveyed, as it is entirely possible that the *specific implementations* of each of these alternatives could all be characterized as "SMALL." In fact, if the comparison had not encompassed a phony solar alternative focused on gargantuan utility-scale solar development on undisturbed lands, and focused solely on distributed rooftop and parking lot PV deployments, the net consumptive land use requirements of the "unreasonable" solar alternative would actually be zero, *less than* the

30-12-LR

'SMALL" and "SMALL to MODERATE" impacts of the nuclear alternatives! The failure to meaningfully quantify and compare impacts is a violation of NEPA, as "the analysis for all draft environmental impact statements will, to the fullest extent practicable, quantify the various factors considered." Only to the extent that there are "important qualitative consideration or factors that cannot be quantified" is it acceptable for NRC to discuss "considerations or factors in qualitative terms." *See* 10 C.F.R. 51.71(d); *see also* 40 C.F.R. § 1502.22(a), "[i]f the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement." 30-12-LR Cont'd

NRDC COMMENT: (page 8-6, line 15) "In addition, because the natural gas-fired alternative derives much of its power from a gas-turbine cycle, and because it wastes less heat than the existing LGS unit, it requires significantly less cooling water." How much less? Please quantify this difference, both in terms of the consumptive uses of freshwater resources and the thermal loads discharged to receiving water bodies. 30-13-AL

NRDC COMMENT: (page 8-6, line 17-20) The draft GEIS Supplement provides high capacity factors for LGS from 2003 to 2010. (a) Please provide the average capacity factors for these units before and after this time interval, and the average lifetime capacity factor achieved for each unit to date. (b) To what extent can the very high capacity factors achieved in this period be attributed to deferred maintenance and capital additions that must be recouped by higher downtimes in subsequent years? (c) To what extent might the very high capacity factors achieved for LGS from 2003 to 2010 reflect a higher degree of operating nuclear safety risk, due to the reluctance of regulators to interrupt economical operations to identify and rectify safety deficiencies? (d) In the more than two years since the Fukushima severe accident, and attendant increased regulatory attention, what has been the operating capacity factor of (a) the US nuclear fleet; (b) all reactors of the same design class as LGS (i.e. GE-BWR Mark II's); (c) all reactors in the PJM Connection? 30-14-AL

NRDC COMMENT: (page 8-6, line 23) "...the NRC presumes that appropriately sized units could be assembled annually to produce electrical power in amounts equivalent to LGS." (a) Why is it rational to presume that Natural Gas Combined Cycle (NGCC) capacity must nearly or entirely replace LGS capacity, leading to excessive fuel consumption and CO2 emissions, rather than examining supplemental NGCC use in a "firming" mode to support maximum achievable market penetration of clean renewable energy alternatives like wind and solar? (b) How much NGCC capacity would be required to firm and backstop sufficient wind, distributed PV, waste-heat cogeneration, and small hydro capacity to replace LGS Unit 1 in 2024 and Unit 2 in 2029, assuming a relicensed LGS capacity factor of 89% and implementation of DSM measures that shrink future PJM demand for LGS output by an average 1.5 % per year over 15 years? (c) 30-15-AL

Please compare the "load-following" characteristics of LGS versus efficient modular Natural Gas Combined Cycle (NGCC) generation. Which represents the better technology for load-following and "firming" high levels of market penetration for "intermittent" renewables? 30-15-AL Cont'd

NRDC COMMENT: (page 8-10, line 7) "The staff estimated that the consumptive water loss for an equivalent-sized combined cycle plant would be about one-third the LGS water use." Please quantify this comparison in gallons-per-day of consumptive use for each technology, and quantify the differences in thermal load discharged directly to receiving waters. 30-16-AL

NRDC COMMENT: (page 8-10, lines 10-16) (a) Please present this stream flow calculation as a comparison between the LGS and IGCC alternative. (b) What is the reduction in stream flow in units of cubic meters per second and expressed as a percentage of the mean annual stream flow in the Schuylkill River, caused by operation of LGS, and what is this stream flow compared to the NGCC alternative? (c) What level of reduction in stream flow from LGS operation triggers "the need for low-flow augmentation from either the Delaware River or the Wadesville Mine Pool?" (d) Please provide technical references for the data used to make this comparison. 30-17-AL

NRDC COMMENT: (page 8-12, lines 39-40) "Most of this land requirement would occur on land where gas extraction already occurs. Some natural gas could come from within Pennsylvania or nearby states." (a) Please provide the factual basis and references for these statements. (b) What percentage of this supply for a replacement NGCC plant might reasonably be expected to come from "fracked" natural gas sources? 30-18-AL

NRDC COMMENT: (page 8-12, lines 41-44) Please provide the factual basis and references for the statement that satisfying the fuel requirement for an extended 20 year LGS operating life requirement would result in the disturbance of 1,640 acres. Upon what assumptions, regarding ore grade, mining and processing techniques, and enrichment tails assay, is this calculation based? 30-19-AL

NRDC COMMENT: (page 8-17, Section 8-2) "Supercritical Pulverized Coal-Fired Alternative": Please provide the detailed scientific and technical basis for the draft GEIS Supplement conclusion that, in light of the global scientific consensus surrounding coal power's outsized contributions to Global Warming, and the serious threat the latter presents to climate stability and species survival, a *new* Supercritical Pulverized Coal Plant with the approximate generating capacity of LGS is nonetheless a "reasonable" alternative to LGS license extension 10-15 years hence, while a low-carbon/renewable energy portfolio enhanced by DSM measures and another decade or more of technology improvements, as described earlier, is dismissed as "unreasonable." Take as much time as you like, as it will take you a long time to explain this assertion. 30-20-AL

NRDC COMMENT: (page 8-20, lines 25 -27) "Without CCS in place [i.e. the more likely deployment scenario] the staff's projected CO2 emissions for the SCPC alternative would be 18,363,843 tons (16,659,678 MT) per year. The overall impact from the releases of GHGs of a coal-fired alternative would be MODERATE." (a) Please describe the scientific and analytical basis for this statement? What specifically about the emission of 16.66 million metric tons of CO2, in addition to 559 MT of fine particulates and 1,118 MT of particulates qualifies as "MODERATE" in comparison to the air quality impacts of available and projected cleaner electricity portfolio alternatives? (b) Does this 16.66 million metric ton figure include the CO2-equivalent emissions from all GHG gas sources involved in the coal mine-to-ash pond life cycle? If not, what would a more complete SCPC life cycle accounting amount to in metric tons of CO2 equivalent per year? 30-21-AL

NRDC COMMENT: (page 8-28, line 11) "Several designs are possible for a new nuclear facility. However, a two-unit nuclear power plant similar to the existing LGS in output is most likely." (a) Please describe the "several designs" that NRC believes are not only "possible" but "reasonably foreseeable" – the relevant NEPA analytical standard -- as partial or complete replacements for the license-extended capacity of LGS. (b) Please provide analytical support for the assertion that construction and operation of "a two-unit power plant similar to LGS in output" is "likely" in the economically competitive wholesale power environment of PJM, given that such costly units would have to be in the detailed planning stages today to be on line when LGS Unit 1's license expires in 2024. (c) Given the failure over the last 13 years of the ever impending "nuclear renaissance" to deploy a conventional gigawatt-class nuclear plant in a merchant power environment, please describe the set of economic and policy circumstances that NRC believes would make such a scenario "reasonably foreseeable" within the next 10-15 years. (d) Ironically, the draft GEIS Supplement fails to consider the contribution that purportedly safer, load-following, and less environmentally-intrusive Small (50-300 MWe) Modular Reactors (SMRs) might make to a low-carbon/renewable energy portfolio to "replace" LGS, even though the Commission is actively considering the licensing of such reactors within the same timeframe as LGS license extension. Please either justify or rectify this omission. 30-22-AL

NRDC COMMENT: (page 8-31, lines 16-17) (a) Please offer quantitative technical support for the conclusion that "the overall impacts on surface water use and quality from construction and operations under the new nuclear alternative would be SMALL, and for the referenced determination (in 4.3.2) that "the impacts of LGS operations on surface water resources are SMALL" relative to other LGS license extension alternatives. (b) Please reconcile this conclusion with the finding on page 8-10, lines 3 to 16, that the "NGCC alternative would require much less cooling water than LGS Units 1 and 2, and consumptive water use would be much less...about one-third the LGS water use." (c) Since a gigawatt class nuclear power plant sets the top of the scale for power plant heat loading of aquatic environment and/or consumptive use of water 30-23-AL

(i.e. it poses an unattractive tradeoff between two environmental harms) please explain how both the nuclear plant and an NGCC plant of equivalent capacity can, relative to each other, both have surface water impacts assessed as "SMALL"? (d) Are the harmful groundwater impacts of ISL uranium mining and natural gas "fracking" included in the assessment that the groundwater impacts of the LGS, New Nuclear, and NGCC alternatives are also "SMALL?" Please provide the empirical basis for this conclusion.

30-23-AL Cont'd

NRDC COMMENT: (page 8-33, lines 23-25) "According to GEIS estimates [that are now 17 years old], an additional 1000 ac (400 ha) of land would be affected by uranium mining and processing during the life of the new nuclear power plant." (a) Please clarify the comparison being attempted here – does the figure of 1000 ac affected by uranium mining and processing "during the life of the new nuclear plant" refer to the 20 year life of the new plant that is comparable to the 20 year license extension of LGS, or to the anticipated 60 year licensed lifetime of both plants. (b) If the latter, does this mean that NRC is asserting that fueling 2350 MW of nuclear capacity at LGS (or a new plant with similar specifications) for 20 years at > 90% capacity factor would only require the disturbance of 1000/3 = 333.33 acres of land for mining, processing, conversion, enrichment, waste storage, fuel fabrication, and disposal? (c) Please provide the complete technical assumptions and methodology used in making this calculation, including the ore grade, mining technology, enrichment tails assay, and fuel burnup assumed in the original GEIS analysis and any updates that may be justified in light of new information after the passage of 17 years.

30-24-AL

NRDC COMMENT: (page 8-46 to 8-48, Section 8.5: Purchased Power) Despite its alleged status as a "reasonable alternative" subjected to "detailed analysis" in the draft GEIS Supplement, this section is exceptionally brief (2.5 pages) and notably devoid of any quantitative or even qualitative analysis. The projected mix(es) of "purchased power," including DSM resources, that could reasonably "replace" LGS Unit 1 in 2024 and Unit 2 in 2029 are nowhere specified, not even qualitatively, and the various broad "area impact" discussions consist of a single paragraph each and carry the usual meaningless labels made worse by in most cases embracing a fuzzy *qualitative range*. You can't get much further than that from an accountable quantitative analysis that can be objectively evaluated and assessed for accuracy.

30-25-AL

Thus we are told, for example, that impacts from this unspecified mix of purchased power would be "Small to Moderate" for "Air Quality" and "Terrestrial and Aquatic," but "Small to Large" for "Land Use" and "Socioeconomics, Transportation, and Aesthetics." How these and other environmental conclusions were arrived at is a mystery, as the analysis is unmoored from any factual or analytical foundation.

The potential role of DSM resources receives a backhanded acknowledgement – "At some times, some portion of replacement power needs may be addressed by PJM's demand

response program" – but this nod literally begs the questions "when" and "what fraction" of LGS replacement power needs could be met by DSM resources? PV solar and other distributed low carbon generation (e.g. small wind, small hydro, industrial waste heat co-gen, combined heat and power, landfill/water-treatment/agricultural bio-gas) appear to be excluded from the "analysis," which merely refers to the Staff's "assessment" that "purchased power" 10 and 15 years hence "would likely come from one or more of the other types of alternatives considered in this chapter," but the analysis refers by name only to "the new nuclear, coal, and natural gas, and wind alternatives described in previous sections," and the mix of even this limited menu of resources that qualifies as "reasonable" (by virtue of its comparative environmental consequences) is never specified. In other words, this section fails to meet the minimum standard for analysis required under NEPA and the NRC's own implementing regulations. 30-25-AL Cont'd

NRDC COMMENT: (page 8-49, Section 8.6: Alternatives Considered but Dismissed) This section is plagued by a dearth of technical data and analysis to support its conclusions, and therefore not surprisingly its environmental conclusions range from misguided to false. 30-26-AL

NRDC COMMENT: (page 8-49, lines 17-20) "Although some aspects of solar generation result in few environmental impacts, solar technology requires substantial land areas." This statement is misleading, and should be revised to say: "Although most (but not all) aspects of solar generation result in little or no harmful environmental impacts, and even net environmental benefits – for example the shading and weather protection afforded by solar parking structures, and the avoidance of long-range transmission impacts afforded by electricity production on or near the site of electricity consumption – some large utility-scale implementations of solar technology require substantial land areas, and some CSP technologies require roughly the same amount of water for cooling of the steam cycle as most other thermoelectric technologies." 30-27-AL

NRDC COMMENT: (page 8-49, line 21) "The potential for solar technologies to serve as reliable baseload power alternative (sic) to LGS depends on the value, constancy, and accessibility of the solar resource." But who is insisting that solar serve as a "reliable baseload power alternative." This is about as sensible as asserting, "The potential of Roger Federer to serve as a reliable quarterback in the NFL depends on the constancy of his throwing arm and his accessibility to the defense." It's asking current solar technologies to forgo what they do well – serving daytime intermediate and peaking power loads – and forcing them to do what everyone knows they can't (yet) do (until the advent of economical large scale electrical storage technologies – provide 24-7 round the clock power to the grid in "discrete baseload applications." 30-28-AL

Forcing solar technologies into the irrelevant straitjacket of "discrete baseload applications" is a none too subtle device to tilt the analytical playing field away from the applications that maximize solar's advantages and toward those that maximize the strengths of nuclear power,

coal, and gas central-station alternative. Get rid of the "standalone baseload" assumption, and embed solar energy in a *portfolio of other renewable and low-carbon electricity resources with complementary characteristics,* and there is basically no limit to the reliable integration of solar energy into the future electricity grid. Such a system will necessarily be organized somewhat differently than the present system, allowing a far greater degree of autonomy, resilience, and reliability than the current central-station, hub and spoke model of electric power production and distribution that fails with virtually every intense summer thunderstorm or winter ice storm. In some areas of the country, some people are already meeting their entire electric power needs from off-grid solar applications, including round-the-clock availability via battery storage.

30-28-AL Cont'd

NRDC COMMENT: (page 8-50, line 10) "Because PV does not produce electricity at night and produces diminished amounts of power during particular weather conditions, the staff does not consider solar PV to provide a viable standalone alternative to license renewal." Again, no one save the NRC Staff and the Exelon is insisting that solar, in order to serve a portion of the load now served by LGS, must by itself provide a "viable standalone alternative to license renewal." This is an arbitrary hurdle confected by the Applicant and Staff that bears no resemblance to reality.

30-29-AL

In the real world of wholesale power markets and emission controls, there is no "standalone" baseload alternative to a 2.3 GW twin-unit nuclear plant save another 2.3 GW (or larger) twin-unit nuclear plant. As the draft GEIS Supplement tacitly acknowledges by its acceptance of an *undocumented random mix* of "purchased power" on the wholesale power market as *a reasonable alternative to LGS license extension*, in the real world there are *few if any* "standalone" baseload options for LGS replacement power, and by far the likeliest LGS replacement option is a *portfolio* of resources, which by 2024 and 2029 will include a wide range of "reasonably foreseeable" electricity resources, including a significant rooftop and parking lot PV solar component.

NRDC COMMENT: (page 8-50, line 35) Contrary to Exelon's absurd portrayal in its ER of a virgin land-based 98,900 acre solar PV replacement for LGS license extension, "the Staff notes that much of the solar capacity installed in PJM is likely to be in the form of rooftop installations," and acknowledges that "this type of installation minimizes land disturbance, can provide electricity to end-users, and minimizes the modifications necessary to the transmission system" Unfortunately, the draft GEIS Supplement does not follow through on the logical implications of these (already widely understood) beneficial characteristics of distributed PV solar, nor explore the likelihood that 100% of all solar PV "land-based installations" could also be undertaken on already disturbed land areas, such as parking lots, freeway embankments, abandoned military bases, and urban –industrial "brownfields, meaning that solar deployment in the densely

30-30-AL

populated PJM connection area would not require *any conversion* of current land in open space uses (e.g. farm land, wildlife habitat, forest areas) to PV solar power production. 30-30-AL Cont'd

NRDC COMMENT: (page 8-53, line 40) "The footprint of a utility scale standalone PV solar installation would be quite large. Based on Exelon's local PJM territory estimates, approximately 98,900 ac (40,000 ha or 155 mi^2 [400 km^2] of land would be needed to support a solar PV alternative to replace the LGS (Exelon 2011)." Why does the draft GEIS Supplement bother to repeat this absurd canard when the Staff has already acknowledged on previous pages that its premises are false? No utility executive would seek to deploy such a massive solar facility on previously undeveloped land in the heavily populated PJM, nor would they obtain the environmental permits to do so, or the financing to purchase or lease that much land, and build the necessary transmission. It's a technical and economic non-starter. This farcical land-based "standalone" alternative distorts the range of solar PV environmental impacts reported in the draft GEIS Supplement (there is insufficient direct normal solar radiation in the PJM Connection area to support concentrating solar thermal power plants (CSP) plants). 30-31-AL

Without this spurious alternative, the Land Use impacts of the "Solar PV Alternative" would be assessed as "SMALL" rather than "SMALL TO LARGE." "Terrestrial Ecology" impacts would likewise be "SMALL" rather than "SMALL TO MODERATE," and so on right down the list. If confined to existing structures and paved over areas in the already built urban and suburban environments, the PV solar alternative would have "SMALL" environmental impacts that would put it on par with the alleged assessed impacts of "continued operation of LGS, " which are likewise deemed SMALL in all impact areas.

NRDC COMMENT: (page 8-57, line 16) "Because this alternative [i.e. a combined 2300 MWe of installed wind capacity, 3000 MWe of solar PV capacity, and 400 MWe of NGCC capacity] many [may] not (sic) be able to generate 2,340 MWe because of the variable wind and solar PV resources, the staff does not consider the wind, solar, and NGCC combination alternative to provide a viable standalone alternative to license renewal. The staff considers a standalone alternative here, however, because Exelon includes a wind, solar, and NGCC combination alternative in its range of alternatives to license renewal in the ER." This is a problematic and self-contradictory paragraph. First, it documents the fact that, for reasons that are not disclosed, the Staff's choice of reasonable alternatives is influenced not by the technical, environmental and economic performance of real world alternatives, by rather dictated by Exelon's earlier choice of alternatives in the ER, no matter how irrational these alternatives turn out to be when subjected to even a minimal review of relevant facts. 30-32-AL

Second, it provides no analytical basis in the above alternative for truncating the fully dispatchable generation and storage components before attaining an aggregate capacity sufficient, with or without DSM measures, to reliably replace the energy services now

supported by LGS. Of course, never mentioned is the fact that LGS itself *must be and is backed up* by excess grid "reserve capacity" (largely coal and gas-fired) for those times when one or both units are down for maintenance or even unplanned and possibly extended "outages," an inherent operational risk of nuclear plants.

30-32-AL Cont'd

Conceptually, this "load following" reserve capacity is no different from the intermediate generation resources needed to "firm" a combination of wind, solar and other renewable resources to whatever level of reliability is believed to be required. It is capricious to truncate this portfolio at some arbitrarily reduced level of readily dispatchable and responsive generation capacity (e.g. at 400 MW of NGCC, as in this example) when it could just as easily include not only more natural gas NGCC capacity but also other distributed but reliably dispatchable resources, such as bio-gas, waste-heat cogen, pumped storage, battery storage, fuel cells, and small and large hydro, which together could reliably cover the range of integrated output fluctuations experienced by a geographically and technologically dispersed portfolio of renewable energy resources.

For example, why not include in this firming portfolio the 703 MWe of hydro potential (a 1997 number!) that the draft GEIS Supplement (p. 8-75, line 19) says is distributed across 104 sites in Pennsylvania, only one of which is larger than 100 MWe? Small hydro technologies have improved over the last 16 years, making it likely than *more than* 703 MWe could be extracted today from the state's hydro resources.

NRDC COMMENT: (page 8-78, line 18) "In the GEIS, the NRC indicated that technologies relying on a variety of biomass fuels had not progressed to the point of being competitive on a large scale or being reliable enough to replace a baseload plant such as LGS...the staff finds biomass-fueled alternatives *are still unable to replace LGS capacity* and are not considered feasible alternatives to LGS license renewal (emphasis added)." *Once again, the draft GEIS Supplement employs an arbitrary and capricious construct – that each electricity technology considered must alone be sufficient to "replace LGS capacity"* – to ignore the contribution that "biomass fuels" – including fuel cells and microturbines running on captured methane from landfills, animal husbandry operations, and water treatment plants – could play in an integrated low-carbon electricity portfolio to provide the energy services that would otherwise be supplied by LGS license extension.

30-33-AL

NRDC COMMENT: (page 8-79, lines 8 – 18) The fuel cell costs given in this paragraph are dated, and in any event, vary widely and should be expressed as a range based on the specific application and the value of the avoided costs arising from that specific application. For example, highly (70%) efficient distributed fuel cells running 75% on biogas and 75% in CHP mode offer significant avoided costs – e.g. vastly reduced GHG emissions, and reduced transmission, fuel, and HVAC costs – that add up to a substantial value proposition that can

30-34-AL

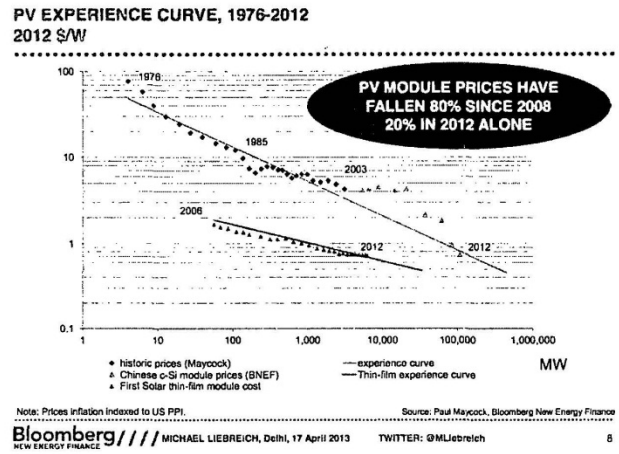
more than offsets their relatively high installed cost-per-kilowatt. NRDC believes that installed costs of fuel cell systems will go down significantly with the increased market penetration and higher production volumes of fuel cell systems in the time period leading up to the possible retirement of LGS Unit 1 in 2024.

30-34-AL Cont'd

The draft GEIS Supplement's unsupported assumption that "fuel cells are not economically or technologically competitive with other alternatives for electricity generation" may or *may not* hold true in 2024 -2029. It thus merits closer analysis, given that distributed fuel cell power plants in the multi-megawatt range and smaller residential/commercial CHP systems are now being installed around the world, including by leading businesses in the U.S. These units have a high availability that approximates "baseload" power applications and could be employed to "firm" renewable energy output and render it "dispatchable" on the grid. As onsite-generated power at the point of consumption, they can also be employed to shed load from the transmission and distribution grid at peak times, and thus represent a potential DSM resource that would tend to reduce the need for extension of the full LGS plant capacity.

NRDC COMMENT: (page 8-79, line 12) Likewise, the installed cost of solar PV ($6,171/kW) given in the draft GEIS Supplement is wildly out of date, seemingly reflecting solar installed costs as of 2008, and thus suggests an lack of due diligence in preparation of the draft GEIS Supplement. As shown in the following chart, PV module prices have dropped 80% since 2008!

30-35-AL



According to a December 2012 report from DOE's NREL and Lawrence Berkeley Laboratory, for utility-scale solar, the capacity-weighted average installed price *declined* from $6.2/W for projects installed during 2004-2008, to $3.9/W for projects installed during 2009-2010, and to $3.4/W for projects installed in 2011. (See http://emp.lbl.gov/sites/all/files/LBNL-5919e.pdf).

The draft GEIS Supplement analysis of solar alternatives appears to be predicated not only on faulty consumptive solar land use assumptions, but on erroneous cost assumptions as well, suggesting that the entire solar alternatives analysis must be redone. 30-35-AL Cont'd

NRDC COMMENT: (page 8-81, line 18, Comments on Section 8.7, No-Action Alternative) This section, which supposedly considers the environmental impacts of the "No Action Alternative" of not renewing the operating licenses of LGS Units 1 and 2 when they expire at the end of their current license terms, in 2024 and 2029, respectively. The section is only 3 pages long, including a half-page summary table, and thus constitutes a mere *pro forma* pretense at presenting a NEPA-compliant analysis of the environmental consequences – both harmful and beneficial -- of "No Action." In fact, the analysis is impermissibly truncated because it addresses "only those impacts that arise directly as a result of plant shutdown," not including "the environmental impacts from decommissioning and related activities," which this section claims "have already been addressed in other documents," and other connected and reasonably foreseeable impacts.

This leaves prompt and direct "shut-down effects" as the only subject for analysis, and in all impact areas save one ("Socioeconomics," which may be "Small to Moderate") these are each assessed in a single paragraph as SMALL, making (absurdly) the impacts of "No Action" environmentally equivalent to the effects of "Continued Operation of LGS," which are likewise all assessed as being "SMALL." The vacuity of this analysis is readily apparent. How can the environmental consequences and risks of operating 2340 MWe of aging and technologically obsolescent nuclear capacity for an additional 20 years have no discernible difference in impacts when compared with not operating this capacity over the same time period? 30-36-AL

Instead of reducing the required analysis of No Action to such meaningless comparisons, the draft GEIS Supplement must address the reasonably foreseeable range of real world consequences from implementing the No Action Alternative, such as potential increases in CO2 emissions and other pollution arising from increased reliance on fossil-fueled generation, to an increased reliance within PJM on DSM measures and low-carbon distributed generation, including vastly greater reliance on clean renewable energy solutions, to the less tangible benefits for citizens of the Philadelphia metro area of living with a reduced risk of being harmed by a severe nuclear accident. This section as currently drafted fails to comply with NEPA. Few potential impacts are examined, and none are quantified in a manner that admits meaningful comparison, as required by law.

NRDC COMMENT: (page 8-84, line 2, Alternatives Summary) The discussion under this heading presents conclusions that are based not on reasoned analysis supported by facts, but rather on the mere application of three vague qualitative labels – "SMALL," "MODERATE," and "LARGE," which are associated with no discernible quantitative measures of impacts, and are themselves 30-37-AL

frequently employed in combination – e.g. "SMALL to MODERATE," "SMALL to LARGE," "MODERATE to LARGE – in a manner that further deprives the required comparison of environmental impacts among alternatives of any substantive meaning.

30-37-AL Cont'd

The lack of accurate up-to-date information on the environmental impacts and installed costs of various alternatives to LGS license extension deprives the analysis – and therefore the deciding agency, other federal agencies, state and local governments, and individual citizens -- of any meaningful ability to weigh the environmental benefits and risks of these alternatives against their costs. The selection of alternatives deemed "reasonable" for detailed analysis is further biased by the imposition of an arbitrary screen that only "standalone baseload alternatives" capable of "replacing" LGS generating capacity *in toto* can meet the underlying purpose and need for LGS license renewal. Imposition of this screen excludes from detailed consideration a wide range of potential low-carbon/DSM/distributed generation/renewable energy *portfolios* that could plausibly provide the same level of energy services that would be otherwise be provided by a 20 year LGS license renewal. In so doing, the draft GEIS Supplement ignores the clear requirement of NEPA to examine "all reasonable alternatives" to the Proposed Action – which courts have subsequently interpreted as requiring analysis of the full *range* of reasonable alternatives – including the environmental consequences of "No Action."

Conclusion

As we noted at the outset, rather than comply with well-established NEPA requirements, the draft GEIS Supplement for license extension of the two reactors at LGS does not provide required analysis and data for a host of issues, including severe accident mitigation, refurbishment, fuel cycle and solid waste disposal and energy alternatives. In addition license renewal for LGS is premature, given the more than a decade of operation remaining under Exelon's current licenses. For these reasons, NRDC respectfully urges the NRC to withdraw the current draft GEIS Supplement, and prepare a more informed and perceptive document that presents up-to-date information and makes meaningful environmental comparisons between the impacts of a full range of reasonable alternatives.

Sincerely,

/s/ (electronic signature)
Geoffrey H. Fettus
Senior Attorney, Nuclear Program
Natural Resources Defense Council
1152 15th St., NW # 300

/s/ (electronic signature)
Matthew G. McKinzie, Ph.D.
Director, Nuclear Program
Natural Resources Defense Council
1152 15th St., NW # 300

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:	)	
	)	
EXELON GENERATION COMPANY, LLC	)	**Docket No. 50-352-LR**
	)	**Docket No. 50-353-LR**
(Limerick Generating Station, Units 1 and 2)	)	
		November 21, 2012

(License Renewal Application)

NATURAL RESOURCES DEFENSE COUNCIL'S PETITION, BY WAY OF MOTION, FOR WAIVER OF 10 C.F.R. § 51.53(c)(3)(ii)(L) AS APPLIED TO APPLICATION FOR RENEWAL OF LICENSES FOR LIMERICK UNITS 1 AND 2

In accordance with the Commission's October 23, 2012 Memorandum and Order (CLI-12-19) (hereafter "Comm. Op."), *see* 2012 WL 5266118, and 10 C.F.R. § 2.335(b)-(d), the Natural Resources Defense Council ("NRDC") respectfully submits this petition for waiver of 10 C.F.R. § 51.53(c)(3)(ii)(L). This waiver request is supported by the attached Declaration of Christopher Weaver, Ph.D, on behalf of NRDC ("NRDC Decl.") and NRDC's Counsel, Geoffrey H. Fettus ("Counsel Decl.").[1]

I. INTRODUCTION

On October 23, 2012, the Commission reversed the Atomic Safety and Licensing Board's ("ASLB") April 4, 2012 Memorandum and Order (ASLBP No. 12-916-04-LR-BD01) (hereafter "ASLB Op."), which had admitted two bases for one of NRDC's November 22, 2011 Contentions concerning Exelon Generating Company LLC's ("Exelon") license renewal

[1] For convenience we are also attaching NRDC's Petition to Intervene and Contentions, along with the supporting technical declaration filed with that Petition ("NRDC Cont.).